

SEPTEMBER 1958

RAILWAY

TRACK *and* STRUCTURES

A Simmons - Boardman TIME-SAVER Publication



Canadian Pacific Railway photo.
The "CANADIAN" Workhouse of Montreal, Que.

RAIL JOINT COMPANY

DIVISION OF POOR & COMPANY, INC.

50 CHURCH STREET, NEW YORK 7, N. Y.

NOW!



The Kershaw Standard
BALLAST REGULATOR

*...your choice of
two great
Kershaw*
**BALLAST
REGULATORS**

Whether your surfacing or ballast maintenance needs call for a heavy duty or a standard weight machine, Kershaw has the Ballast Regulator and Scarifier to fit your requirements.

**Either Machine
Performs These
14 Distinct
Operations...**

1. Distributes Ballast in Center of Track
2. Plows Out Excess Ballast
3. Transfers Ballast from Inside to Outside of Curves
4. Regulates Ballast on Shoulder
5. Scarifies Foul Ballast
6. Plows Ballast from Tie Ends
7. Breaks Up Mud Pockets at Tie Ends
8. Reclaims Ballast from Toe Line and Places It on Tie Heads
9. De-weeds and Removes Vegetation from Ballast
10. Regulates and Shapes Center Line in Double Track
11. Transfers Ballast from Shoulder to Heads and Centers
12. Scarifies Road Crossings
13. Sweeps Loose Ballast from Ties
14. Blows Snow from Tracks



The Kershaw Heavy Duty
BALLAST REGULATOR

FOR
ADDITIONAL
INFORMATION
... WRITE
OR CALL

KERSHAW
MANUFACTURING CO. INC.



P. O. DRAWER 1711

MONTGOMERY
ALABAMA



Rugged steel body contains fuel and combustion chambers, self-closing filler cap keeps out dirt and moisture, sliding cover regulates size and height of flame. Flanges prevent scorching of ties, shield flame from wind.

When winter comes, use Winter Kings

The Winter King switch heater is a compact little unit designed to fit easily between the ties and under the rails. Kerosene-burning, it furnishes a friendly orange flame which melts the snow as it falls. The 1½ gal fuel chamber is sufficient for from 9 to 15 hours of operation, depending on the easily-adjusted size of the flame.

Fuel can be added while the Winter King is in operation, and one man can care for as many as 100 units, if they are not too widely scattered. Completely self-contained, the Winter King can be easily moved to any location, and requires no look-

ing-after, other than an occasional refilling with fuel.

Now is the time to be sure you have plenty of Winter Kings ready for the first fall of snow. Their low first cost is hard to beat, and their dependable operation is a prime reason for their growing popularity. A Bethlehem representative will be glad to discuss the Winter King switch heater in detail. You can reach him through any Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



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PROOF THAT BIRD SELF-SEALING TIE PADS

Extend bridge tie life by at least ten years

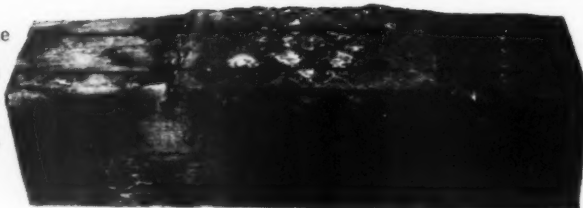
After 10 Years' Protection:

This 8" x 16" bridge tie has been protected for 10 years by Bird Self-Sealing Tie Pads. Pad is still securely sealed to the tie to prevent even the slightest penetration of moisture or abrasive materials. The beading at the edges of the pad is characteristic of Bird Tie Pad performance.

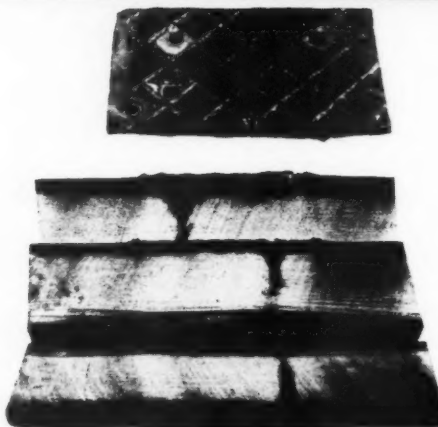


These unretouched photographs of a bridge tie dramatically illustrate the underplate protection afforded by Bird Self-Sealing Tie Pads. Life of the *preceding* deck on this bridge at Akron, Ohio, was 19 years. When the deck was replaced in 1948, Bird Self-Sealing Tie Pads were installed. The sound condition of the ties today, after 10 years, indicates *at least* a 50% increase in their life expectancy beyond that previously obtained without the protection of Bird Self-Sealing Tie Pads. Write for interesting booklet to Bird Tie Pads, East Walpole, Massachusetts, Department HRT-9.

Pattern Bottom Plate: This is the same tie, halved and slabbed. Note imprint of pattern bottom tie plate on the pad. *Bird Self-Sealing Tie Pads give the same rugged, lasting service when used with either pattern-bottom or smooth-bottom tie plates.*



Under-Plate Protection: Slabbed sections of the halved tie show the excellent condition of under-plate and spike hole wood after 10 years' protection by Bird Self-Sealing Tie Pads.



PHOTOS COURTESY OF ERIC RAILROAD

Bird Self-Sealing Tie Pads are Recommended for:

BRIDGE DECKS • CURVES • SWITCH TIMBERS
• HIGHWAY GRADE CROSSINGS AND OTHER
PAVED AREAS • CROSSING FROGS • INSULATED
JOINTS • WITH SMALLER TIE PLATES • PILE
CUTOFFS • THROUGH STATION PLATFORMS
• OUT-OF-FACE INSTALLATIONS IN RAIL LAY-
ING PROGRAMS • SANDY LOCATIONS • ALL
OTHER LOCATIONS WHERE TIE LIFE IS SHORT
OR REPLACEMENT COSTS HIGH.

Best...



Buy BIRD

RAILWAY

TRACK *and* STRUCTURES

Published monthly by the

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RAILWAY TRACK and STRUCTURES

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vol. 54, no. 9

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Tells how visibility for yard crews is assured by the use of open-type support consisting of prestressed concrete piles.	
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DON'T MISS . . .

Raising of levees at both ends of a bridge that couldn't be raised posed a special problem for the Missouri Pacific. Solution: Convert the

structure into a watertight "trough" and anchor it against uplift during times of high water in the stream below.

. . . in the October issue

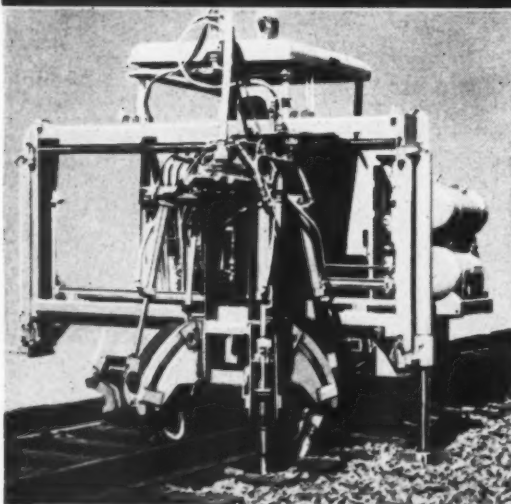
SEPTEMBER, 1958

5

IN TRACK MAINTENANCE...

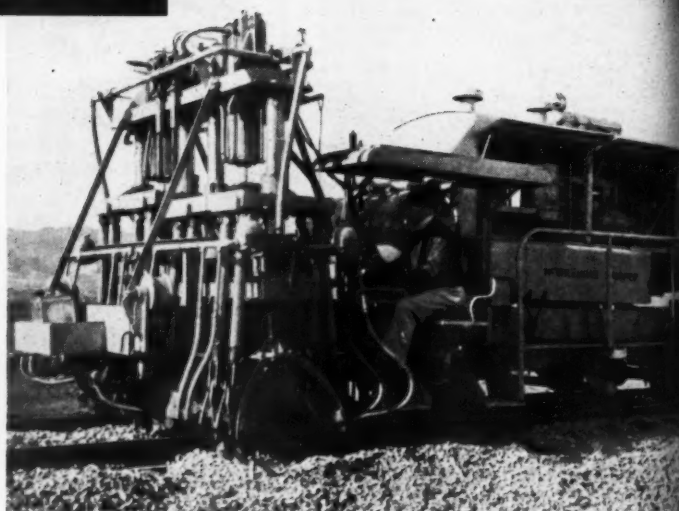
*These Jobs**
are Done Best
by **RMC** **MACHINES**

*** TIE TAMPING**



McWILLIAMS SPOT TAMPER

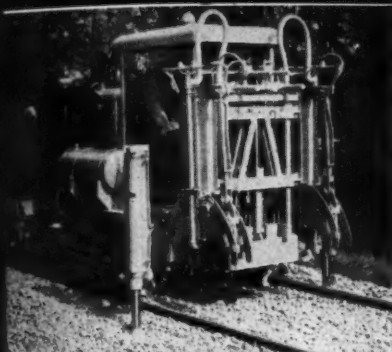
Provides big-tamper ballast compaction for smoothing, spot surfacing and yard and terminal maintenance.



McWILLIAMS PRODUCTION TAMPER

Will finish tamp any raise up to 6" at speeds up to 720' per hour.

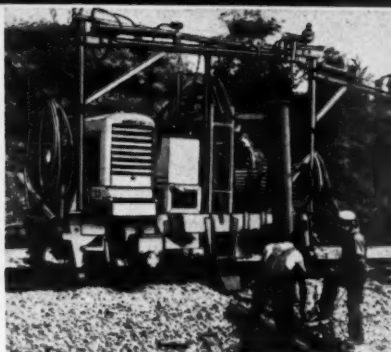
* JACK TAMPING



R. M. C. JACK TAMPER

Only machine that will raise and tamp track . . . and hold established grade, keeping ahead of one or two production tampers.

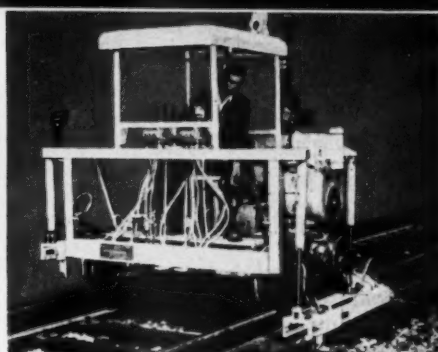
* TIE REPLACING



R.M.C. TIEMASTER

Replaces ties at a rate of approximately one per minute with three men, with minimum track disturbance.

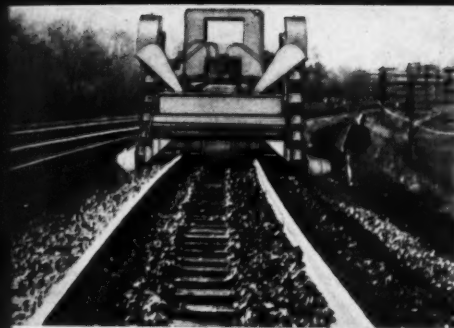
* TIE SPACING



R.M.C. TIE SPACER

Corrects poor tie spacing and slewed tie conditions by means of two hydraulic shifting devices.

* DISTRIBUTING BALLAST



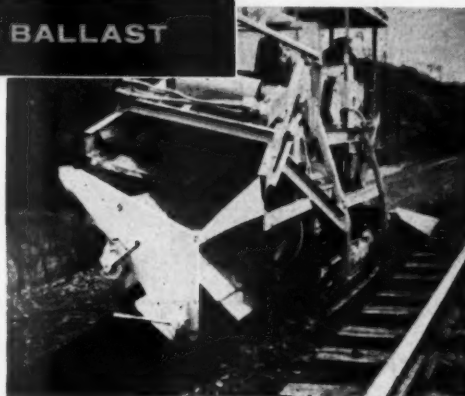
McWILLIAMS BALLAST DISTRIBUTOR

Places ballast in desired quantity in exactly the proper position for tamping, shaping shoulder and inner-track space.

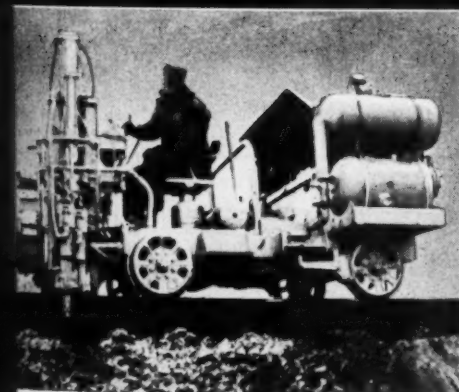
McWILLIAMS SUPER MOLE

Cleans or excavates shoulder ballast at speeds up to 2400' per hour.

* CLEANING BALLAST



* DRIVING SPIKES

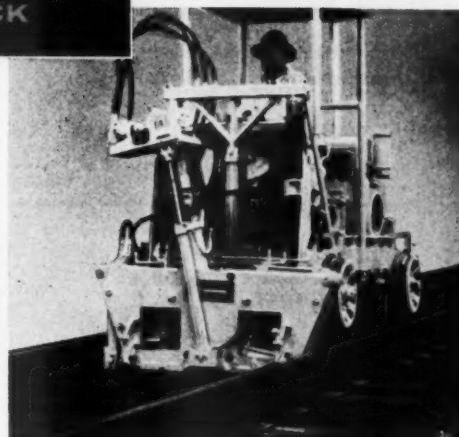


R.M.C. SPIKEMASTER

Nips up the tie and drives four spikes, one on each side of both rails. Speed: better than six ties per minute.

R.M.C. LINEMASTER

Lines over 6000 feet of track per day, using an operator and one man sighting. Wheel-mounted and crawler mounted models.



Railway Maintenance Corporation

PITTSBURGH 30, PA.

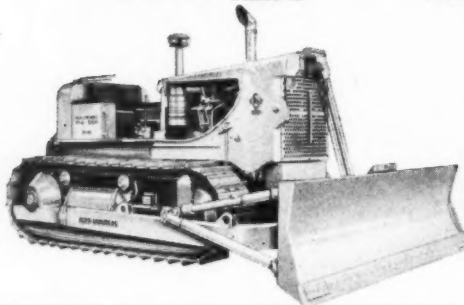
fastest growing acceptance in the

Allis-Chalmers crawler tractors for every application

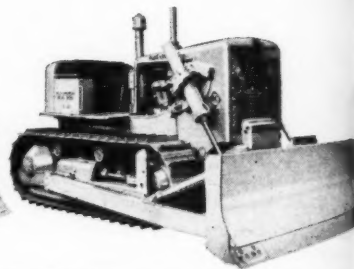
... plus a complete line of
matched bulldozers, side
booms, mounted rippers,
other attachments.

*All weights approximately as illustrated.
Twelve other tractor models available.

HD-21 225 net engine hp
torque converter drive
56,260 lb*



HD-16 torque converter drive
150 net engine hp
39,090 lb* | all-gear drive
141 belt hp



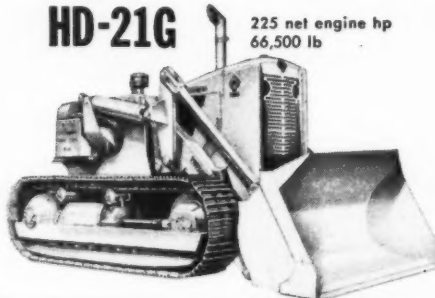
Allis-Chalmers tractor shovels in a full range of bucket sizes...

up to 7-cu-yd capacity to
match requirements for
various materials and
job conditions.

4-CU-YD

HD-21G

225 net engine hp
66,500 lb



3-CU-YD

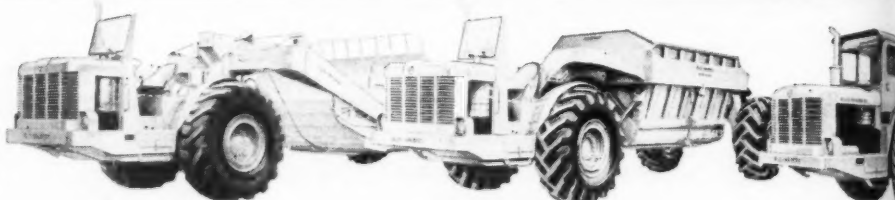
HD-16G

150 net engine hp
47,800 lb



Allis-Chalmers motor scrapers and wagons...

five models that offer
major advantages
on big jobs or
utility work.



TS-360

280 hp
Struck — 15 yd
Heaped — 20 yd

TW-360

280 hp
Struck — 17 yd
Heaped — 24 yd

TR-260

200 hp
Struck — 11 yd
Heaped — 15 yd

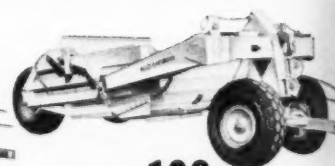
Allis-Chalmers pull-type scrapers...

the only line with low
bowl, high apron lift,
forced ejection in
every size.



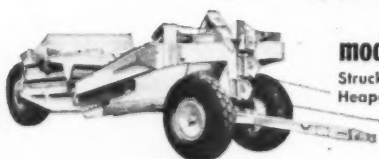
model 315

Struck — 15 yd; Heaped — 20 yd



model 108

Struck — 8.4 yd
Heaped — 12 yd



model 106

Struck — 6.1 yd
Heaped — 8.5 yd

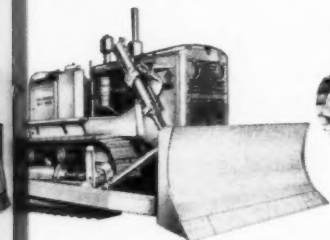


model 44

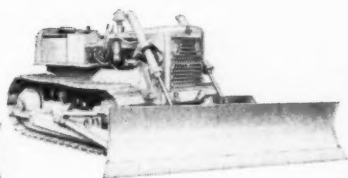
Struck — 4 yd
Heaped — 5.5 yd

the business . . . ALLIS-CHALMERS CONSTRUCTION MACHINERY

HD-11 94 belt hp
25,960 lb*

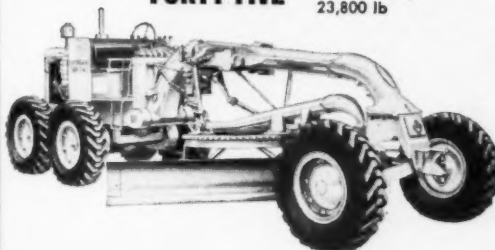


HD-6 63 belt hp
16,470 lb*

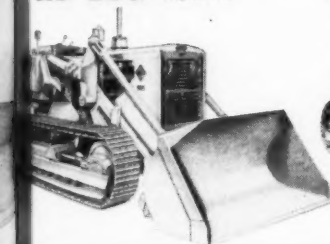


Allis-Chalmers motor graders...
designed for comfort-conscious
operators and cost-conscious owners.

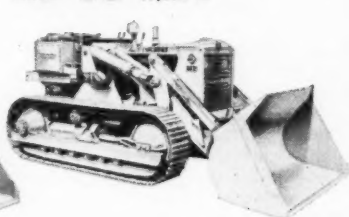
FORTY-FIVE 120 brake hp
23,800 lb



2 1/4-CU-YD
HD-11G 111 net engine hp
32,000 lb

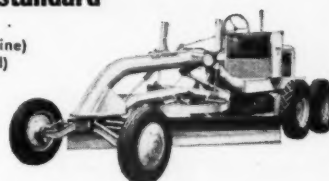


1 1/2-CU-YD
HD-6G 72 net engine hp
19,600 lb



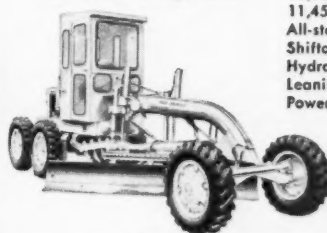
model D standard

50 brake hp
8,800 lb (gasoline)
9,350 lb (diesel)



model D special

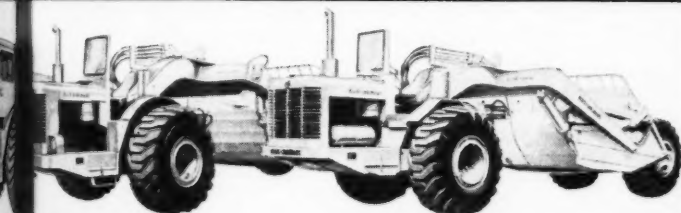
50 brake hp
10,900 lb (gasoline)
11,450 lb (diesel)
All-steel cab
Shiftable moldboard
Hydraulic scarifier
Leaning front wheels
Power circle turn



ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION
MILWAUKEE 1, WISCONSIN

TS-260

200 hp
Struck — 11 yd
Heaped — 14 yd



TS-160

155 hp
Struck — 7 yd
Heaped — 9 1/2 yd

**DESIGNED AND BUILT FOR HIGH-VOLUME
PERFORMANCE YOU CAN DEPEND ON**

**Look ahead... *move ahead*...and stay ahead
with **ALLIS-CHALMERS****



CANADIAN NATIONAL — **John H. Spicer**, assistant general supervisor of budgets, and an engineer by training and experience, has been promoted to chief budget officer, with headquarters as before at Montreal. **A. E. Argue**, assistant district engineer of the Southern Ontario district, has been appointed division engineer with headquarters at Cochrane, Ont.

L. Pizzardi, assistant roadmaster, has been promoted to roadmaster with headquarters at Montreal, Que., succeeding **N. St. Pierre**, who has retired. **J. P. E. Champagne**, assistant roadmaster of the L'Assomption Subdivision, has been appointed assistant roadmaster of the St. Jerome division, with headquarters at Val Royal, Que., succeeding Mr. Pizzardi.

CHICAGO GREAT WESTERN — **A. E. Smith**, assistant chief engineer, Oelwein, Iowa, has been appointed chief engineer there, succeeding **J. H. Sawyer**, resigned. The position of assistant chief engineer has been abolished.

MILWAUKEE ROAD — **C. H. Tusler** has been appointed principal assistant engineer, Lines West, with headquarters at Seattle, Wash.

MINNESOTA TRANSFER—ST. PAUL UNION DEPOT—**John L. Jensen** has been appointed chief engineer, St. Paul, Minn., succeeding **Norman F. Podas**, retired.

NEW HAVEN—**Harold W. Jenkins**, assistant chief engineer, New Haven, appointed chief engineer there, replacing **T. Peter Polson**, retired. The engineering department has been reorganized. The posts of maintenance engineer and general bridge and building supervisor have been abolished; all track and bridge and building supervisors now report directly to division engineers. **Albert E. Cawood**, engineer of structures, New Haven, promoted to assistant to chief engineer. **Edwin N. Chapin**, assistant engineer of structures, succeeds Mr. Cawood as engineer of structures. **Murray J. McGovern**, district engineer, New York, named contract engineer. **Frederick O. Bassinger**, assistant to chief engineer, named engineer plumbing and heating. **Richard J. Phillips**, maintenance engineer, New Haven, appointed division engineer there. **Harry B. Bussing**, maintenance engineer, Boston, named division engineer, there. **George H. Shepard**, special engineer, New Haven, appointed assistant division engineer at the same point. **Burt K. Heald**, assistant maintenance engineer, Boston, appointed assistant division engineer there. **William A. Crosby**, chief clerk to chief engineer, named office assistant to chief engineer.

NEW YORK CENTRAL — **C. F. Hunt** has been appointed division engineer, Ohio Central division, Columbus, Ohio, succeeding **R. J. Hardenbergh**, transferred.

ROCK ISLAND — **H. G. Dennis**, assistant engineer maintenance of way, has been promoted to engineer maintenance of way, with headquarters as before at Chicago, succeeding **J. T. Fitzgerald**, who has retired effective September 1.

SEABOARD AIR LINE — The office of the chief engineer, along with those of other system officers, has been moved from Norfolk, Va., to the company's new general office building at 3600 W. Broad St., Richmond, Va.

SOUTHERN — **John T. Hiner**, assistant chief engineer maintenance of way and structures of the Western Lines, has been promoted to chief engineer, maintenance of way and structures of these lines, with headquarters as before at Cincinnati, Ohio. Mr. Hiner succeeds **James S. Wearn**, who has been appointed assistant chief engineer maintenance of way and structures with the same headquarters.

Herbert D. Minnis, Jr., assistant division engineer at Hattiesburg, Miss., has been promoted to division engineer at Selma, Ala., succeeding **J. William McPherson**, who has been transferred to Greenville, S.C. **Dennis L. Belk**, track supervisor at McDonough, Ga., has been promoted to assistant division engineer at Princeton, Ind., succeeding **Paul A. Perkins**, who has been promoted to division engineer at Alexandria, Va. Mr. Perkins succeeds **John H. Hall** who has been transferred to Knoxville, Tenn.

Joseph R. Goodman has been appointed track supervisor at Valdosta, Ga. **Troy A. Barnett** has been named track supervisor at McDonough, and **Robert H. Campbell** has been appointed track supervisor at Greenwood, S.C.

SOUTHERN PACIFIC — **Oscar Bickerton** has been appointed assistant general supervisor work equipment, with headquarters at San Francisco, Calif. **Eugene B. Keeling** has been appointed assistant general supervisor work equipment at Los Angeles.

Obituary

C. T. Dike, retired vice-president and chief engineer of the Chicago & North Western, died on August 2 at Stockton, Calif.

Floyd A. Poling, 54, division engineer of the Wheeling & Lake Erie District of the Nickel Plate, with headquarters at Brewster, Ohio, died July 20.

Biographical briefs

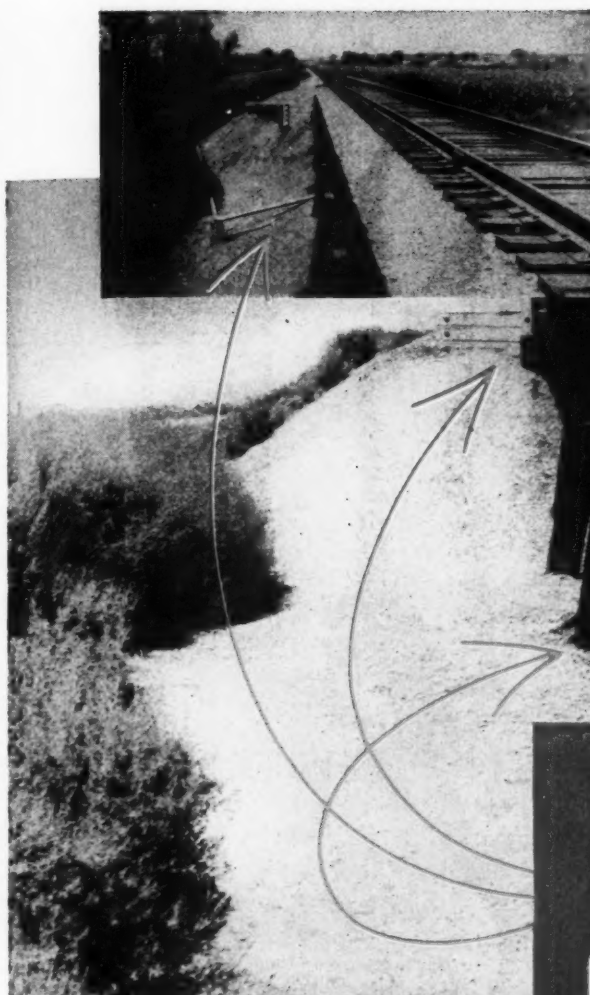
Paul A. Perkins, who has been promoted to division engineer on the Southern at Alexandria, Va. (as announced else-

where in this issue), is a native of Barber Junction, N. C. He began his service with the Southern in February 1936 as a section laborer at Bryson City, N. C. After serving in the same capacity at Rockmart, Ga., he was appointed roadway storehouse man at Atlanta, Ga., in October 1942. After a period of military service, he returned to the Southern in October 1945 and was made assistant track supervisor at Athens, Tenn., in January 1950. He was promoted to track supervisor at Sylva, N. C., a short time later, being transferred to Cordele, Ga., in December 1953. A year later he was promoted to assistant division engineer at Princeton, Ind., which position he was holding at the time of his recent promotion.

Dennis L. Belk, who has been appointed assistant division engineer on the Southern at Princeton, Ind. (as announced elsewhere in this issue), was born at Scottsboro, Ala. He entered the service of the Southern as a section laborer at Knoxville, Tenn., in July 1928, and later served in various capacities on the Atlanta and Knoxville divisions. In January 1950 he was appointed assistant track supervisor at Atlanta, Ga., and in May 1950 he was advanced to track supervisor at Griffith, Ga. In August 1953 he was transferred to McDonough, Ga. where he remained until his recent promotion to assistant division engineer.

Robert E. Cozadd, 31, who was recently appointed supervisor of track on the Illinois Central at Centralia, Ill., (*RT&S*, July, p. 10), entered railroad service with the IC in May 1942, serving as section laborer, roundhouse laborer and switchman at Carbondale, Ill. until November 1944 when he left the IC for military service. He returned to the road as section laborer at Carbondale in September 1946, and in November 1948 was promoted to motor car operator at that location. In March 1956, he was named track inspector at Carbondale, then advancing, in February 1957, to general foreman of track, the position he held at the time of his recent promotion.

John H. Spicer, who has been appointed chief budget officer of the Canadian National (as announced elsewhere in this issue), was born in Moose Jaw, Sask. He graduated from the University of Manitoba in 1948 with a Bachelor of Science degree in civil engineering. He joined the CNR at Winnipeg in 1948, and has since served at Vancouver, B. C., Port Arthur, Ont., Prince Rupert, B. C., Kamloops, B. C. and Edmonton, Alta., holding the positions of assistant engineer, acting division engineer, division engineer, assistant district engineer and district engineer. In 1957 he was appointed assistant general supervisor of budgets at Montreal, the position he was holding at the time of his recent appointment.



Effectively
STOP WEEDS
with
Concentrated BORASCU®



your best defense against weeds on tough terrain!

Protecting your timber structures from the fire hazard of weeds and grasses is simple and safe with Concentrated BORASCU. It kills vegetation and prevents regrowth with carry-over control which can last for a year or longer!

Applying Concentrated BORASCU is easy and inexpensive. Just a man with a pail can treat any type of terrain quickly. This granular borate

material comes to you ready for use. There is nothing to mix—no water to haul!

Roads, big and small, from coast to coast are now using Concentrated BORASCU. They favor it for the safety, economy, effectiveness and convenience it offers. Your road, too, can benefit by using Concentrated BORASCU weed killer...write today for descriptive literature.

Check all these features:

- EASY TO APPLY... AND SAFE
- RESULTS THAT ARE LONG-LASTING
- NONSELECTIVE • NONPOISONOUS
- NON FIRE-HAZARDOUS
- NONCORROSIVE TO FERROUS METALS

AGRICULTURAL SALES DEPARTMENT

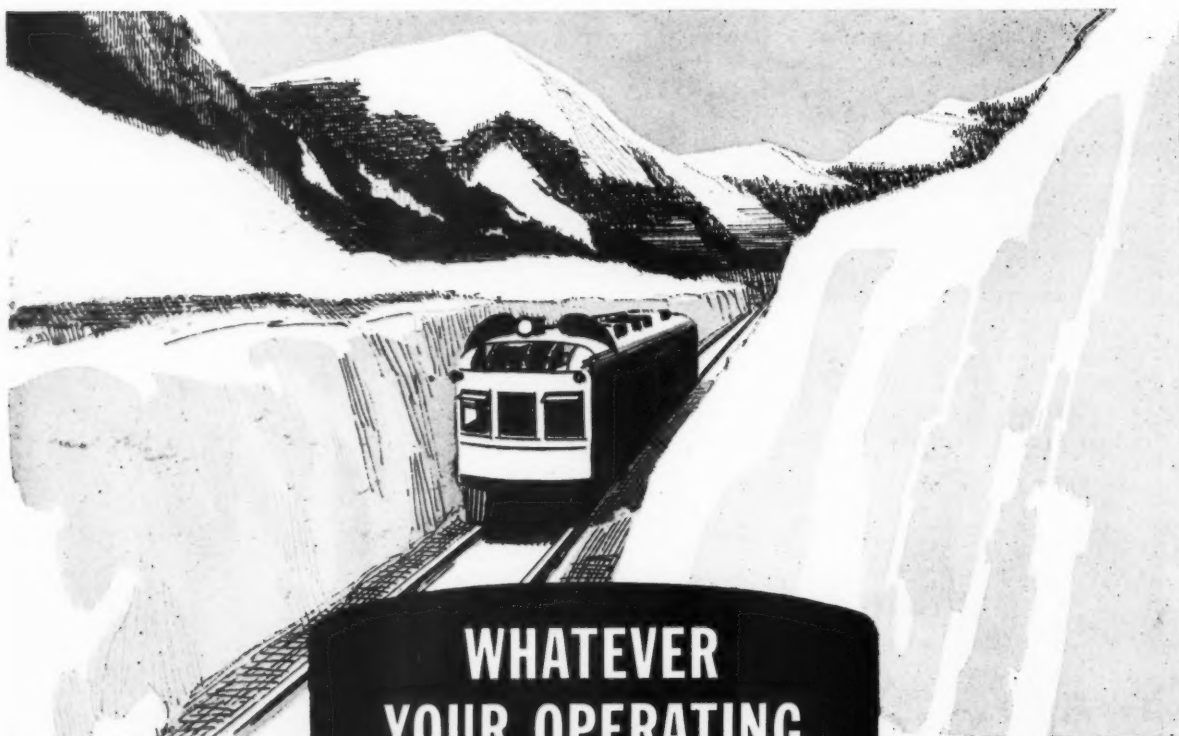
United States Borax & Chemical Corporation

PACIFIC COAST BORAX COMPANY DIVISION

630 SHATTO PLACE, LOS ANGELES 5, CALIFORNIA

MANUFACTURERS OF FAMOUS "20 MULE TEAM" PACKAGE PRODUCTS





WHATEVER YOUR OPERATING CONDITIONS...

Sperry Rail inspection will help keep your rail safe!

Tropical heat, sub-zero cold, very heavy traffic or very light traffic...whatever your operating conditions and maintenance-of-way problems, Sperry Detector Cars provide a vital service to make your rail safe. The efficiency of Sperry equipment and personnel not only results in the detection of more and smaller defects, but also assures large dollar savings by preventing costly damage to track and equipment. The value of Sperry rail inspection is proved through millions of track miles tested to date.

Today, Sperry offers railroads a complete and highly efficient service for testing rails in track. An outstanding new rail-testing concept now being developed by Sperry research will make it even more complete tomorrow.

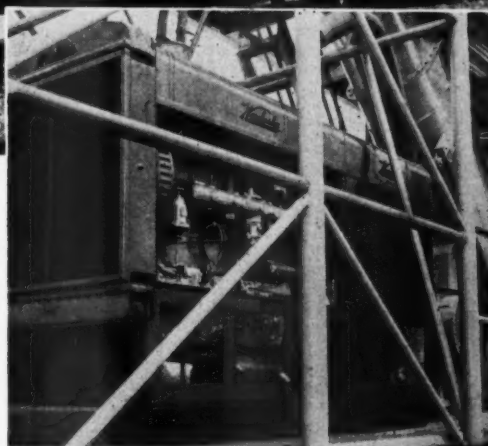
Altitude, temperatures as low as -30°F , and a snow season extending from October to April combine to make maintenance of way a really tough problem for the great Canadian transcontinental railroads. Under these rigorous conditions, regular rail inspection by Sperry Detector Cars plays a vitally important part in detecting rail defects at an early stage of development, thus helping to maintain highly efficient operations at all times.



DIVISION OF SPERRY PRODUCTS, INC.
Danbury, Connecticut



WAUKESHA **ENGINEATOR®** powers Car Icing Machine Unit



Moving on a track alongside refrigerated car trains... no icing platform needed... this mobile icing machine unit ices cars on either side. So flexible is its extending or retracting snout, that four hatches of adjacent ends of two cars can be iced from one position. With four men, a train is iced at two minutes per car.

This Waukesha-Engineator-powered mobile unit is speeding the icing of the Pacific Fruit Express Co. cars at Eugene, Oregon. Its head-end 4-wheel tractor carries the power plant and icing machinery; and the four 4-wheel trailers

haul a total of 60 tons of ice in 300 lb. blocks.

On the tractor is a Waukesha 100 KW Engineator (a gasoline engine operating at 1800 rpm direct-connected to a 240/480 AC 3-phase 60-cycle generator). It powers controls (in cab on snout), ice breaker and elevator delivering ice to snout, also chain elevator (through trailers) which feeds ice to breaker. Breaker makes coarse or fine ice, which is salted at the top platform. Waukesha Engineators for gas, gasoline or Diesel fuels are available in 50 to 800 KW capacities. Send for descriptive bulletins.

392

RAILWAY DIVISION WAUKESHA MOTOR COMPANY • WAUKESHA, WISCONSIN

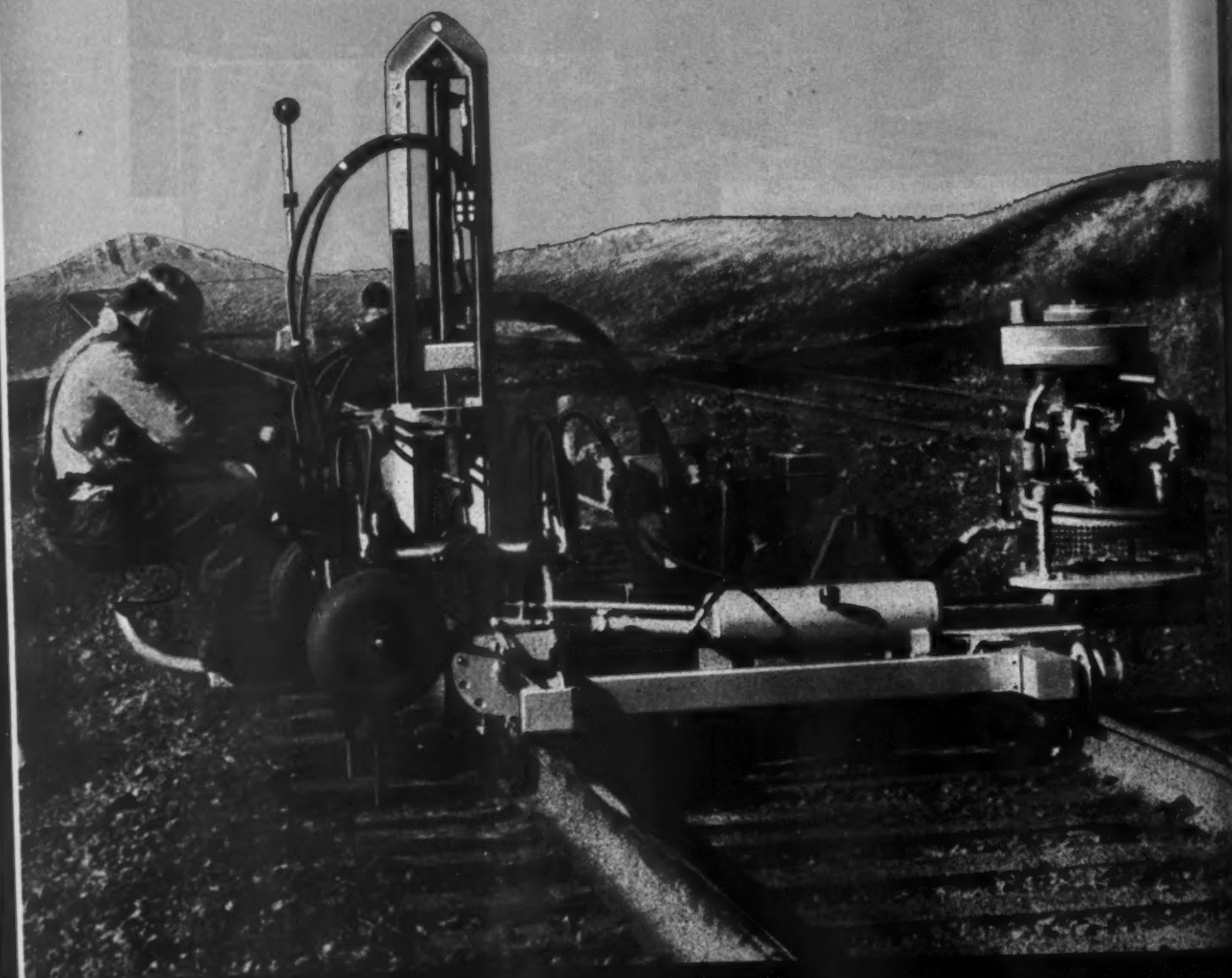
RAILWAY TRACK and STRUCTURES

SEPTEMBER, 1958

13

Now . . . you can spot tamp at lower costs with . . .

238
minutes
per day



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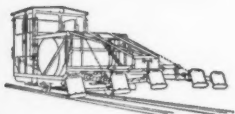
MA
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Fairmont

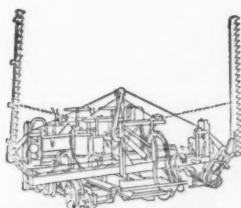
THE FAIRMONT W99 SPOT TAMPER (illustrated on the left) raises low joints to track level quickly and easily. It is a lightweight, self-propelled riding type unit operated by one man. Actual tamping is done by air with hydraulic power for accurate control of the guns. For long service life and reduced operating expenses, the guns stop automatically when raised and start automatically when lowered. It's versatile, too! The W99 can be turned easily in a matter of minutes to work the opposite rail. Modernize and mechanize your maintenance crews with the Fairmont W99 Spot Tamper.

Other Fairmont

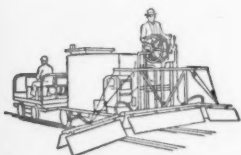
Maintenance Equipment



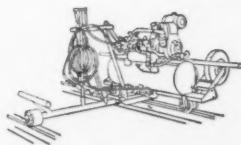
W55 SERIES C WEED BURNER is a thorough and efficient weed killer and snow melter. Burner heads can be positioned quickly and easily. Intense flame destroys vegetation regardless of roadbed contour.



W24 SERIES A WEED MOWER features cutting bars which are hydraulically operated by an engine-driven pump. Sickles are driven by hydraulic motors. Safety snap-sickle design. Includes power grinder.



W78 SERIES B WEED SPRAY CAR is a trailer type unit which applies liquid weed killers. Lightweight, compact, low cost. Two-cylinder engine, 1,000 gallon tank and 11-nozzle spraying. Efficiently designed and soundly built.



W72 SERIES A OIL SPRAYER is a compact, efficient unit requiring a minimum crew for operation. Applies clean, heated oil—under pressure—to both sides of angle bars. Four-cycle, single-cylinder engine; thirty gallon tank capacity.

FAIRMONT RAILWAY MOTORS, INCORPORATED FAIRMONT, MINNESOTA

MANUFACTURERS OF BALLAST MAINTENANCE CARS, DERRICK CARS, OIL SPRAY CARS, GROUTING OUTFITS, TIE RENEWAL EQUIPMENT, RAIL RENEWAL EQUIPMENT, WEED CONTROL EQUIPMENT, HY-RAIL CARS, TRACK MOTOR CARS, PUSH CARS AND TRAILERS.

Helps from Manufacturers

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

EARTHMOVING EQUIPMENT. A new 8-page booklet entitled "Balanced Power . . . Matched to the Job" has been issued by the manufacturer. The two-color booklet, form number D837, explains the advantages of D4, D6, and D7 tractors and includes brief specifications for each machine. Photographs and case histories on many jobs are included. Matched equipment and tools are illustrated. (Write: *Caterpillar Tractor Company, Advertising Division, Dept. RTS, Peoria, Ill.*)

EXCITED-LIGHT SOURCES. A four-page bulletin, designated 30.30, has been issued to describe radioisotope-excited light sources for industrial signal systems and markers. Included is a description of Krypton 85-excited lamps, called Isolites. These units consist of radiation responsive phosphor crystals, enclosed in a hermetically sealed transparent capsule and excited by radioactive Kr 85 gas. The bulletin notes that these lamps, which require no external power source, provide service and operating efficiencies not attainable with light sources of any other type. (Write: *United States Radium Corporation, Dept. RTS, Morristown, N. J.*)

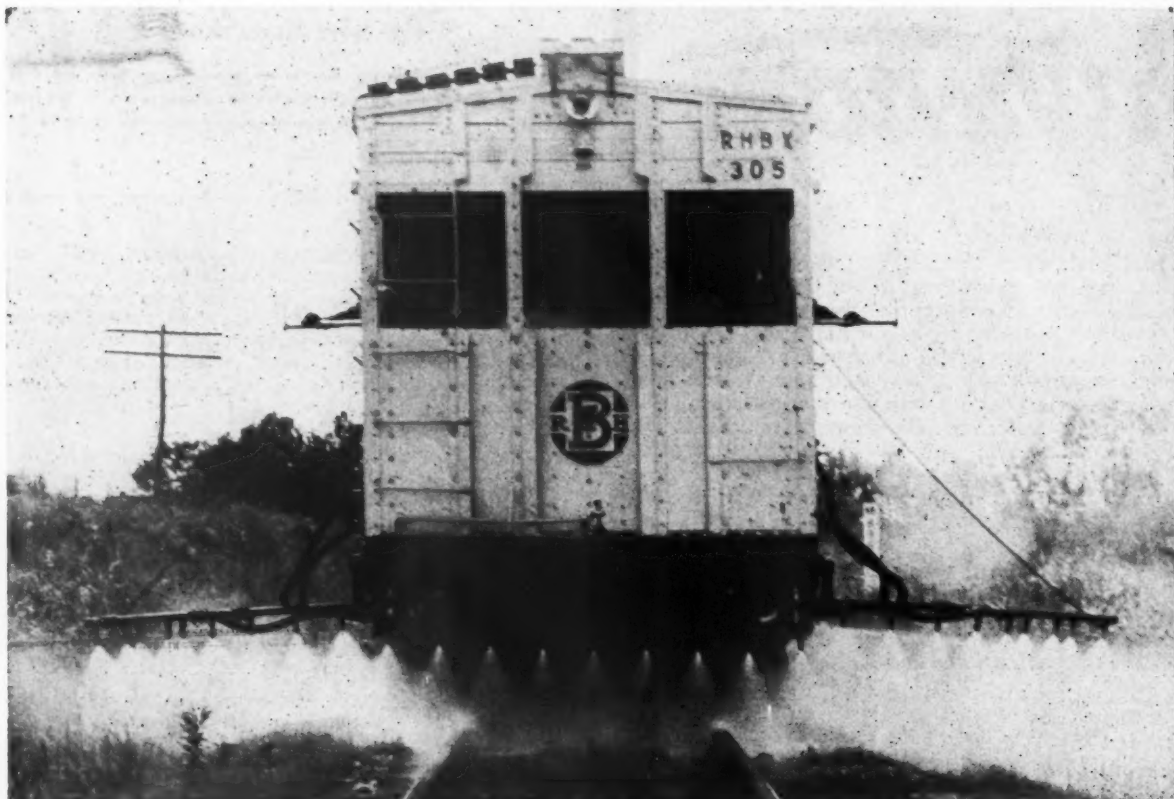
BRIDGE BEARING PADS. Brief descriptions of a molded neoprene pad, designated Neosorb, and an impregnated fabric pad material, designated Sorbtex, for bridges and structures are given in a recently issued six-page folder. These products are illustrated with line drawings and photographs and show typical applications and general information on the proper selection of the pad materials. (Write: *Preformed Pad Division, Dept. RTS, Voss Belting & Specialty Company, 5645 N. Ravenswood Avenue, Chicago 26, Ill.*)

CURTAIN WALL SYSTEMS. A 16-page, 3-color catalog is now available to show developments in window and curtain wall design. Line drawings, diagrams and cutaways are used to illustrate both the aluminum and steel types of window walls. Specifications are also suggested. (Write: *The William Bayley Company, Dept. RTS, Springfield, Ohio*)

FRAMING ANCHORS. Complete design information for Trip-L-Grip framing anchors has been released by the manufacturer in an eight-page booklet. This literature contains information for specification writing, tables of recommended safe working values and maximum joist spans, and applications for efficient joining of 2-in by 4-in to 2-in by 12-in members in wood construction. Sixteen popular applications of this grip are illustrated, with information as to the type of anchor, placement, and recommended design practice for each use. (Write: *Timber Engineering Company, Dept RTS, 1319 Eighteenth Street, N.W., Washington 6, D.C.*)

CUTTING TORCHES. A complete line of Oxweld flame-cutting equipment is described and illustrated in a new six-page folder, Form 1174. Torches that can be used interchangeably with every fuel-gas combination—oxy-acetylene, oxy-propane, oxy-natural gas—are described. The folder, entitled "Oxweld Flame-Cutting Apparatus," covers manual and machine-cutting equipment for use on every flame-cutting job from thinnest sheet metal to risers 10 ft thick. (Write: *Linde Company, Division of Union Carbide Corporation, Dept. RTS, 30 East 42nd St., New York 17, N. Y.*)

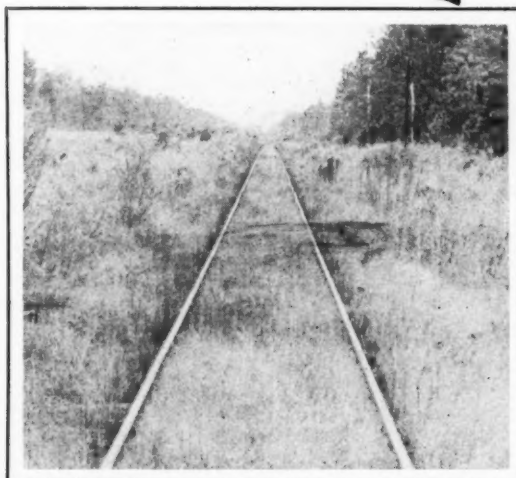
MOVING SIDEWALKS. A new 8-page booklet describing the manufacturers three types of passenger conveyors has been issued. Specifications and schematic drawings for carrier-bed, slider-bed, and roller-bed conveyors are included. Illustration of two installations are presented with brief descriptions. (Write: *Hewitt-Robins, Inc., Dept. RTS, 666 Glenbrook Road, Stamford, Conn.*)



Which is more Economical . . . THIS? →

Every maintenance engineer knows the answer. There is absolutely no comparison in the cost of a well-conceived weed control program and the eventual toll in poor drainage and a host of other ills that beset track taken over by weeds and grass. It has been repeatedly proved that consistent application of the *right* chemicals applied with modern equipment pays off in lowered maintenance costs—year after year, and to omit treatment *only one year*, can mean the loss of several years effort toward weed-free-track. That has been the experience of Bogle customers who know the advantages of using a weed and brush control service with a record of proved results over the years.

. . . or THIS? →



Complete Weed and Brush Control Service

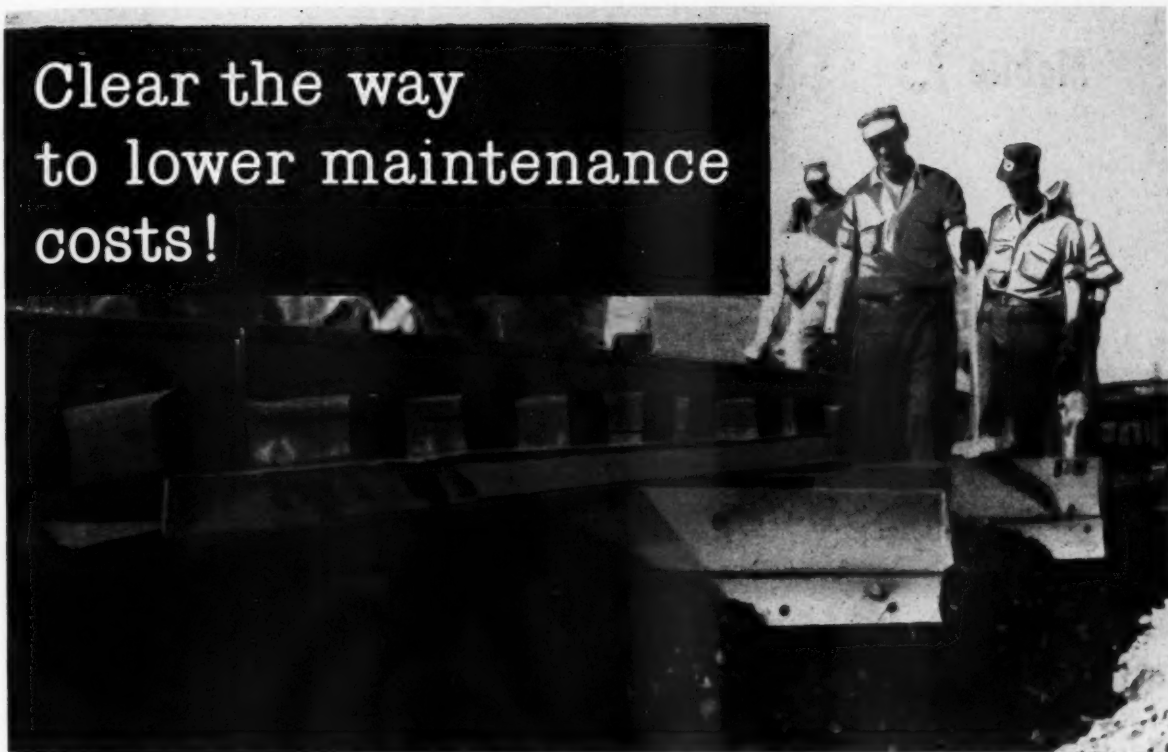


THE R. H. BOGLE CO.

ALEXANDRIA, VA.

MEMPHIS, TENN.

Clear the way
to lower maintenance
costs!



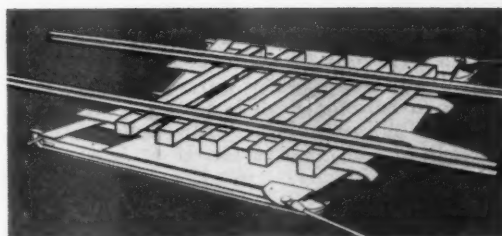
*MANNIX PLOW "sweeps" old ballast out to track shoulders.
Special models for double track work to one shoulder only.*

MANNIX SLED AND PLOW

Reballasting job to be done? Hitch a work train to a Mannix Undertrack Plow - world's fastest and simplest method of removing old ballast. The Plow does the job in a single pass regardless of the consistency of material to be plowed out. After distribution of new ballast, follow up with the Mannix Undertrack Sled, designed to give a 4-inch raise each pass! Used independently or together these fast-paced Mannix units are cutting time and costs on leading roads. Inquire about Mannix service and special rental plan. A representative will call if you wish.

Ask about free 16 mm. film showing.

4020 MINNETONKA BLVD., MINNEAPOLIS 16, MINN.
PHONE WALnut 7-9411



MANNIX SLED passes under track in the same way as the plow . . . raises track on new or existing ballast.





Koehring® 205 truck crane speeds maintenance and material-handling

Consider what the high-speed mobility and extra capacity of this Koehring 205 truck crane can mean on your scattered maintenance, construction, material-handling work — out along the line, around shops, in yards, etc. It drives 30, 40 miles, or more, in less than an hour's time. Travel is unrestricted — overall width is only 8 feet. Axle load-distribution meets highway regulations in most areas, even when carrying 25-foot boom over the steering end.

With this mobile crane you're equipped to lift any load up to 15 tons (based on conservative 85% rating). It also handles $\frac{1}{2}$ to $\frac{3}{4}$ -yard clamshell bucket — does stockpiling, loads and unloads coal, chemicals, other bulk materials. Readily converts to dragline, pile driver, $\frac{1}{2}$ -yard shovel or hoe. To suit your working conditions, this Koehring 205 is available on a choice of truck, Cruiser®, crawler mounting — or self-propelled rail car. See Koehring distributor soon or send for more information.

Mail to: KOEHRING Division, Milwaukee 16, Wisconsin

Send data on 205 with: ☐ truck ☐ Cruiser ☐ crawler ☐ RailAid mounting

NAME _____

TITLE _____

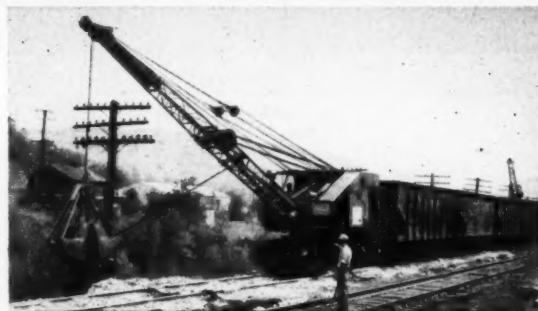
COMPANY _____

DIVISION _____

STREET _____

CITY, STATE _____

K838 RTS



Developed especially for the railroads, Koehring 205 self-propelled RailAid® travels on-track at speeds up to 20 m.p.h. Crane or excavator loads or unloads itself on ramp-equipped rail car in less than 10 minutes — sets car on or off-track. Propulsion car has 2-axle drive, airbrakes on all 4 standard-flange wheels. Wide car-well accommodates 16, 20 or 24-inch crawlers on Koehring 205 excavator or crane.



You have come to expect more work capacity in Koehring machines, and you get just that — on work trains (above) or on independent off-track operation. Check all sizes: shovels from $\frac{1}{2}$ to 3 cubic yards — and cranes with heavy lift capacities up to 95 tons.



KOEHRING

DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wis.

Dear reader:

Can the associations do a better job?

There never was a time when the railroads were more in need of the services of the Roadmasters' and Bridge & Building Associations than right now.

Cost reduction, while maintaining the properties to adequate standards, is the dominant motive on all railroads today. The two associations are in a position to make important contributions to that end. The question they should ask themselves now is this: Are we making the most of our opportunities to serve the railroads in their hour of need?

A factor that assures this question will be tackled honestly and objectively is the make-up of the Executive committees of the two groups. The associations have always had the knack of selecting dedicated men to serve on these committees. They were never more dedicated than they are today. This fact is evident to anyone who has had the opportunity of observing the earnest and conscientious manner in which they deal with association problems.

Rank-and-file members have, as a whole, exhibited this same devotion in their attitude toward the affairs of the associations. Their readiness to volunteer for work on committees and the spirited manner in which they engage in discussions during the annual meetings are examples of this attitude.

How can this loyalty of the officers and members be used to assure optimum performance of the associations on behalf of the railroads? Take, for example, the traditional practice of using special committees to investigate and report on current problems and developments. Is it basically sound? We think so, but it could be that modifications and improvements are in order. The inability of the committees to hold meetings has always been a handicap to the chairmen in preparing their reports. Several years ago the Roadmasters' Association acted to overcome this handicap by arranging meetings of their committees during the AREA convention in March. This is a commendable practice that might well be adopted by the B&B Association. Also the question could be raised whether improvements are possible in the Roadmasters' practice in this respect. The meetings are now held during the AREA convention. Would attendance be improved if they were held prior to, or following, the AREA meetings?

The reports of the associations have frequently been criticized for being too general in nature. In an effort to overcome this criticism, the Roadmasters' established three standing committees several years ago — one on track, another on roadway and a third on machinery for maintenance of way work. The time has now come to reappraise the work of these committees to determine if they are functioning as originally intended.

Both the Roadmasters' and the B&B Associations fill a need not served by any other association. Their objectives are commendable. Their success in living up to these objectives depends on how much practical, useful information they can make available to their members. This should be the guiding thought of the respective Executive committees as they chart the future courses of the associations.

MHD

*proved and
improved

MATISA

flash
thoroweld[®]
rail

experience and
equipment is available
to give you safe
welded rail, now

THE QUALITY OF THE WELD IS
MATISA'S FIRST CONSIDERATION

Imperfect welds mean broken rails. A Matisa thoroweld starts right—with a burn-off of rail impurities . . . uniform heating over the entire surfaces of both joining faces . . . a 50-ton impact blow completes a forging-quality union of rail to rail. All operations are automatically precision-timed while rails are rigidly clamped in alignment—your assurance of weld after weld of the same high quality.

*Pioneered by the Santa Fe . . .
and the Great Northern railroads.
Send for brochure showing the
complete thoroweld process.*

MATISA
EQUIPMENT
CORPORATION

1020 Washington Avenue
Chicago Heights, Illinois

matisa production line efficiency

Matisa production is planned production. The entire process has been broken into job elements; a planned work station for each. Each job element is mechanized and geared to maximum weld production and the most effective use of today's expensive manpower.

News notes...

TRACK and STRUCTURES

... a résumé of current events throughout the railroad world

The Transportation Act of 1958, signed into law by President Eisenhower on August 12, gives the railroads more latitude in making competitive rates, "freezes" exempt agricultural commodities, gives the Interstate Commerce Commission more power over intrastate rate making and intrastate service changes, and contains other provisions designed to improve the position of the railroads, including federal guarantee of loans to railroads of up to \$500 million.

While helping the railroads in one direction, congress was taking steps to penalize them in another. Bills containing provisions to liberalize railroad retirement and unemployment benefits were reported favorably to both houses. The Association of American Railroads estimates that the proposed bills would add nearly \$200 million a year "to the payroll costs of already overburdened and financially distressed railroads." Imposition of this new burden, said the AAR, "would be an invitation to disaster for the railroads—with grave consequences to the economy and the defense of the nation." The measure was passed in the Senate but defeated in the House of Representatives.

Plans of several midwestern railroads to dualize or centralize agency stations ran into two major snags. In Minnesota, the Hennepin County District court tossed out the dualization plan of the Minneapolis & St. Louis for that state. The court took the position that Minnesota law requires the road to have an agent on duty at its stations during the business day. Meanwhile, the Chicago & North Western was faced by a strike threat of the Order of Railway Telegraphers after the road put central agency plans into effect in South Dakota and Iowa. The strike was called for 6 am, August 21, but the North Western obtained a restraining order heading off the walkout. The railroad said no violation of work agreements or contracts with the ORT exists, but that the union is demanding agreement on a new contract provision, stating that "no position in existence on December 3, 1957, will be abolished or discontinued except by agreement between the carrier and the organization." Such a provision, the railroad charges, would freeze for all time the number of station agents and telegraphers, regardless of need.

Customers of the Inland Steel Company's railroad division have been informed by the company that it will quit producing rails, joint bars and tie plates on September 13. The company had announced earlier that these products would be continued to the end of the year, but the move was accelerated, according to an announcement, so that "displaced personnel might be absorbed in other departments of the steel mill where additions to personnel are now being made."



PERMANENT CURE FOR SOFT SPOTS . . .

SEABOARD FINDS THE ANSWER IN PRESSURE GROUTING

Seaboard Air Line Railroad began their program of pressure grouting with portland cement in 1946. Water pockets and soft spots in roadbeds had been major sources of trouble. On many of the curves, slow orders were necessary during every wet spell. Maintenance crews had to be sent back to the same trouble spots time after time.

Seaboard's grouting program has paid off and the cost

has been low. Previously unstable track now requires little or no maintenance. Schedules are maintained, no matter what the weather. Every division has its own grouting outfit and uses it to cut down maintenance costs. It's just one of the many important ways that progressive railroads are using portland cement and concrete to build for economy . . . for durability . . . for better service.

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

STRENGTH DURABILITY ECONOMY

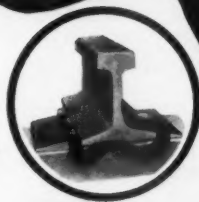
THE IMPROVED GAUTIER RAIL ANCHOR

Here is one of the heaviest,
and most rugged, rail anchors
on the market. It is made
from alloy spring steel . . .

it is tough, durable, and
sure-gripping with plenty of
take-up so that it can be
used again and again . . .

it is applied with a maul or
spike maul and it can't be
overdriven. For Strength,
Durability, and Economy . . .

specify
and insist on the
Improved Gautier
Rail Anchor



MID-WEST FORGING & MANUFACTURING COMPANY

Distributors: D. V. MAHER, Cleveland, Ohio; WILLIAM ALLEN, Denver, Colorado; JOHN O'BRIEN, St. Paul,
Minnesota; W. T. RICHARDS, San Francisco, California; G. C. HUNT & CO., Atlanta, Georgia

**How would you
like to save
your road \$49.00
per-car, per-year?**



YOU CAN—by specifying Koppers Pressure-Treated Lumber in place of untreated wood!

And this \$49.00 per-car per-year does not include savings on labor and the increased car revenue that results from less shop time per-car for maintenance.

Let's look at the reasons Koppers pressure-treated lumber can offer your railroad similar savings:

1. Pressure-treated lumber prevents decay and resultant mechanical failure.
2. Pressure-treated lumber lasts 3 to 5 times longer in service than untreated lumber.
3. Cars built with pressure-treated wood members earn more per-day because they are out working and not in the repair shops.

Yes, pressure-treated lumber makes possible substantial savings per-car per-year. If you would like to benefit from these savings, let Koppers analyze your lumber problems and show you how pressure-treated wood products can fill your needs.

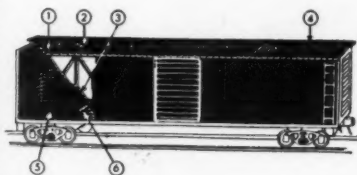


**KOPPERS
PRESSURE-TREATED
WOOD**

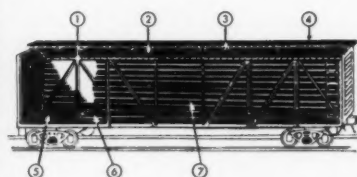
WHERE TO USE



PRESSURE-TREATED LUMBER FOR CONSTRUCTION AND REPAIR



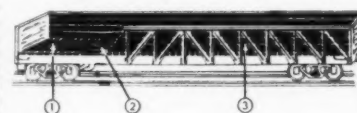
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| ① ROOFING | ⑤ RUNNING BOARDS |
| ② SADDLE BLOCKS | ⑥ FLOORING |
| ③ LINING | ⑦ NAILING SILLS |



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| ① FRAMING | ⑤ FLOORING |
| ② ROOFING | ⑥ NAILING SILLS |
| ③ SADDLE BLOCKS | ⑦ SLATS |
| ④ RUNNING BOARDS | |



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| ① DECKING | ② NAILING SILLS |
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| ① DECKING | ③ SIDE PLANKS |
| ② NAILING SILLS | |

HOW TO GET THE COST CUTTING FACTS

This 12-page booklet gives the "dollars and cents" facts on how your railroad can save thousands of dollars per year with pressure-treated wood. Write for a copy.



**Wood Preserving Division
KOPPERS COMPANY, INC.**
774 Koppers Building
Pittsburgh 19, Pa.

T-5

trim right-of-way
MAINTENANCE
COSTS
 with this
NEW HIGH SPEED
BRUSH
CUTTER!



- ★ Light weight over back and shoulder carrying position reduces operator fatigue
- ★ More powerful 2.5 h.p. motor designed for continuous, heavy-duty service
- ★ Saw arm elbow and knee joints give operator extra maneuverability and firmer footing
- ★ Lower-cost, easier maintenance... "V" belt drive



"Slash" is the word to describe what the new Southworth portable Brush Cutter does to right-of-way maintenance costs. One operator, plus this lightweight, versatile performer, does the work of eight men with brush hooks or scythes. The two big features that make this equipment so valuable are extreme maneuverability and "work horse" power. Exclusive saw arm elbow and knee joints provide easy cutting of brush, trees or limbs at any height within reach. Extra power permits cutting of trees up to 8" and larger, by notching.

The major portion of the Brush Cutter's 39 lbs. is carried comfortably on the operator's back...nature's saddle...where the weight is hardly noticeable. "V" belt drive simplifies field maintenance, eliminates costly repairs, gear stripping, etc. Added features include automatic clutch, finger tip throttle control and large gas capacity for long hours of uninterrupted use. The cutting arm is easily disassembled in less than one minute for convenient transportation. Special 10" heavy duty circular saw is positioned for operator safety.

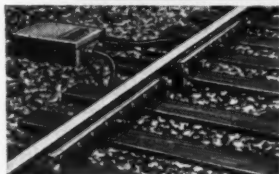
Write for descriptive bulletin and prices...

★ **Maintenance Equipment Company** ★

Division of Peor and Company

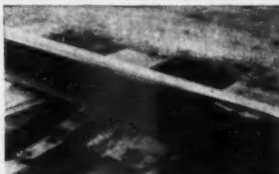
RAILWAY EXCHANGE BUILDING · CHICAGO 4, ILLINOIS

R-1575RR



MECO RAIL AND FLANGE LUBRICATOR

Doubles to quadruples curve rail and locomotive wheel flange life, by reducing friction between rails and wheel flanges on curves. Also makes possible higher speeds with greater safety.



MACK REVERSIBLE SWITCH POINT PROTECTOR

Prolongs the life of switch points about 4 times; then is reversed and again extends the switch point life for another similar period.



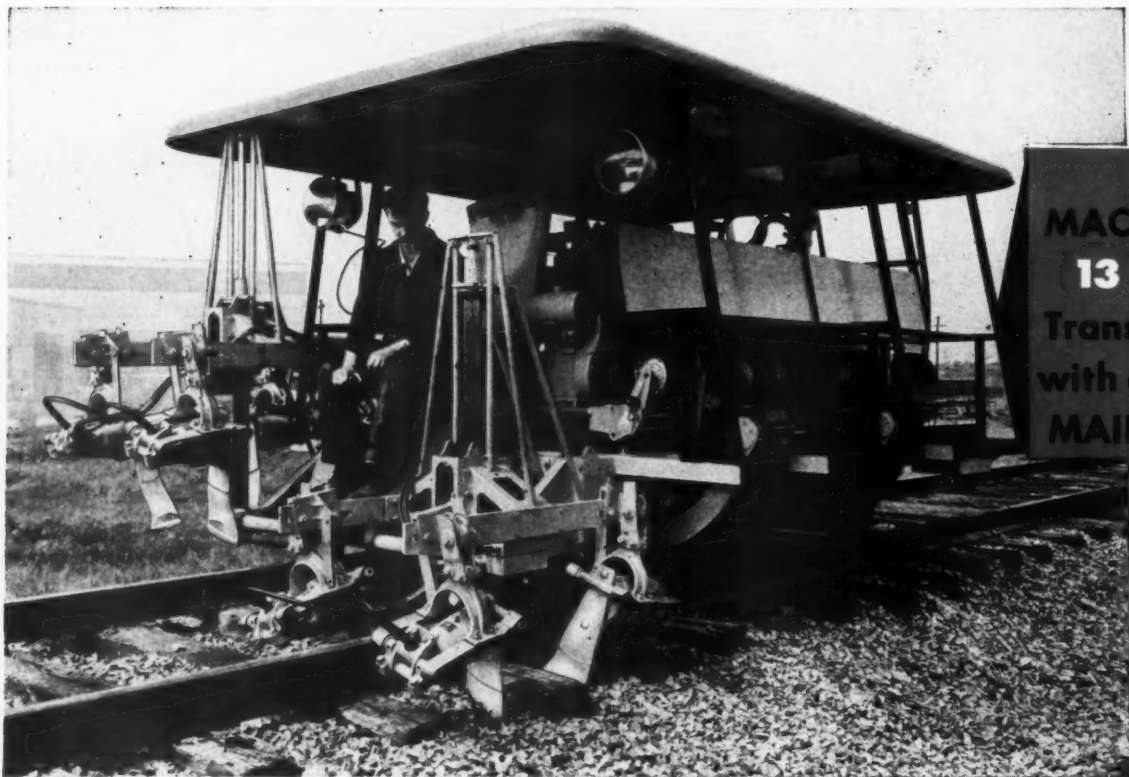
MECO POWER RAIL LAYER

Reduces labor cost to minimum in laying Standard Rails, Long Rails, Continuous Welded Rail. Operates efficiently with large gang of 100 men or more and requires a machine crew of only 3 or 4 men.

NEW CONCEPT IN TRACK SECTION

Tamper **MULTI-GANG*** PACKAGE UNIT

Greatly Lowers Maintenance Costs



A COMPLETE UNIT—all three machines (or other equipment) are housed in Main Car.

RAPIDLY REMOVED FROM TRACK by Crawler Set-Off . . . in a matter of seconds.

POWER DOWNFEED OF INDEPENDENT WORKHEADS . . . operates easily.

HYDRAULIC PROPULSION . . . the Main Car travels up to 25 MPH.

THESE HYDRAULIC MACHINES are easily loaded on or unloaded from Main Car, by hydraulic Tail Rack.

LOOK WHAT THE MULTI-GANG WILL DO:

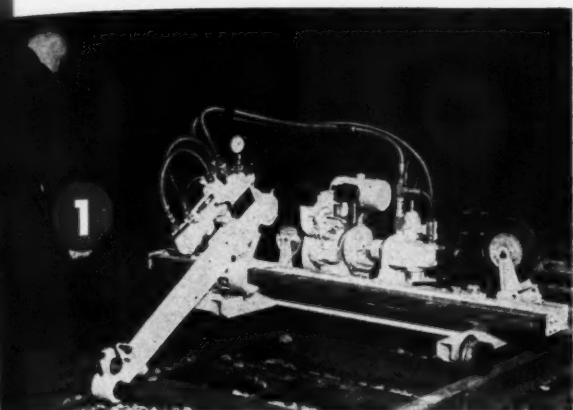
surface • line track • pull spikes without bending • remove or insert ties • torque controlled bolting • drills rail
MULTI-GANG'S Main Car is 171' long x 113' wide x 84' high.

TAMPER MULTI-GANG PACKAGE UNIT

consists of:
Main Car with Power Downfeed Tamper and Crawler Set-Off
Hydrillbolter
Spike Hydrejector—Tie Hydrenewer
Combolineer

MULTI-GANG UNIT EXTENDS THE TRACK SECTION

SECTION MAINTENANCE



HYDRILLBOLTER* (Model BD)

Combination Bolter and Rail Drill

Hydraulic Transmission

Minimum Mechanical Replacement Parts

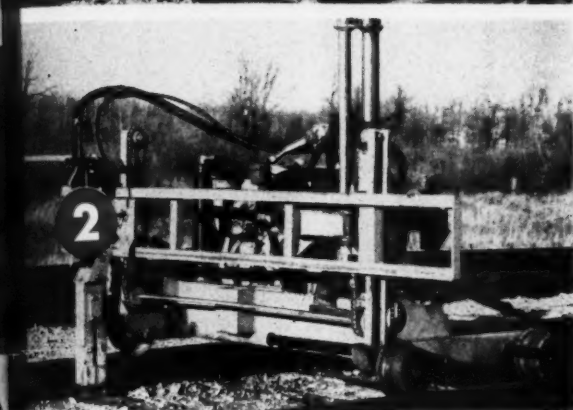
BOLTER

- single control lever, manned by one operator
- automatic change from high speed, low torque, for 'running up' nuts to low speed, high torque for nut tightening
- handles nuts on either side of both rails

DRILL

- drill attachment adapted in less than 2 min.
- manned by one operator
- easily adjusted for different rail sizes
- drill bits quickly interchanged

HYDRILLBOLTER can be removed from track by two men.



SPIKE HYDREJECTOR*

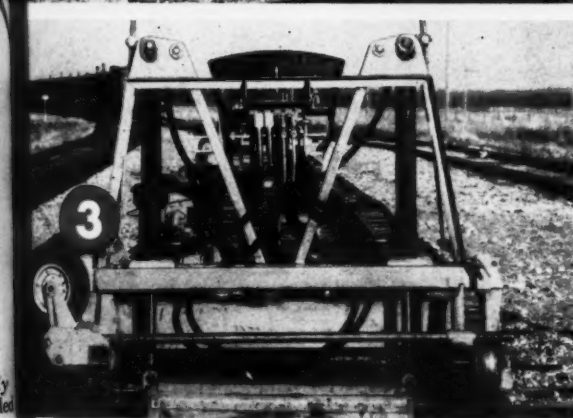
TIE HYDRENEWER* (Model PR)

Combination Spike Puller and Tie Renewer

pulls spikes without bending • lightweight • completely hydraulic • easily operated by one man.

Tie Renewer is adapted to Spike Puller in seconds
No disturbance of track line or surface
Renews without digging out tie ends

Removed from track by one man.



COMBOLINER* (Model JL)

Combination Powered Jack and Track Liner

powerful • lightweight • compact

- 10,000 lbs. thrust to throw the track in either direction
- simply insert lining anchors and slide out wheels to line the track
- lifts track to 10 inches, rail dogs engage automatically
- turntable allows easy pivoting
- cross level indicator reads directly in inches of elevation
- no wheels, axles to interrupt view of rails

Easy to remove from track.

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NOW... SAVE UP TO 13,000 SPIKES PER MILE

*... reduce tie splitting
from excessive spiking*

GAGE LOCK SPIKES

Two Gage Lock Spikes to a plate do a better holding job than 4 cut spikes on tangents and light curves. Fewer spikes are driven — causing less tie damage and permitting a saving of nearly 13,000 spikes per mile. The Gage Lock Spike is a plate fastening as well as a rail spike. It has an indented throat, offset at the tie plate surface. Result: thrust and wear are avoided from the edge of the rail base.

TIE PLATE LOCK SPIKES

Both the Tie Plate Lock Spike and the Gage Lock Spike hold the rail to gage and avoid plate cutting. When driven to refusal, the spread shank is compressed and binds against the walls of the hole with spring pressure. Play is eliminated — plates are held against movement — rail is held to gage and plate cutting is avoided.

RAIL LOCK SPIKES

Rail Lock Spikes offer the same design as Gage Lock Spikes, but are not offset at the plate surface. The throat protrudes 1/16" — resultant pressure binds the spike against the rail base edge. Play is eliminated between the tie plate shoulders — the rail is held to a true gage.

Forward-looking management can extend the cycle of track structure by using Lock Spikes. One regaging operation costs more than the initial cost of installing Lock Spikes. Specify spikes having a low annual cost—Specify Lock Spikes.



BERNUTH, LEMBCKE CO., INC.

420 LEXINGTON AVENUE, NEW YORK 17, N.Y.

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160-ton diesel wrecker
but...*



today

it's driving piles!

EVERY ORTON CRANE has:

- ... **ALL** power shafts carried on sealed anti-friction bearings — NO exceptions.
- ... **ALL** motion entirely independent.
- ... **NO** jaw clutches — not even in travel mechanism.

ORTON VERSATILITY is exemplified by this combination diesel wrecker-pile driver. **YOUR** machine, built to your requirements . . . delivered for less than a "production line" crane!

ORTON EXPERIENCE always gives you the very latest proved design. ORTON, in more than fifty years of building the finest cranes, has been *first* with Torque-Control, *first* with air-operated controls, *first* to recognize that each handling job is unique.

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The repeat business
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RAIL GRINDING

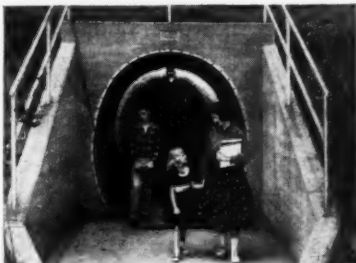
Putting a "Hole" Through a Railroad Fill?



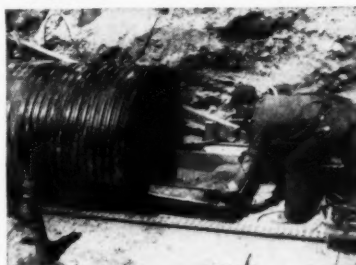
Near Bonners Ferry, Idaho, the Great Northern's main line track extends along a river that sometimes floods lowlands on the other side of the fill. Supplementing an inadequate small culvert, this Armco Liner Plate structure was installed to quickly equalize water levels and minimize danger of washouts.



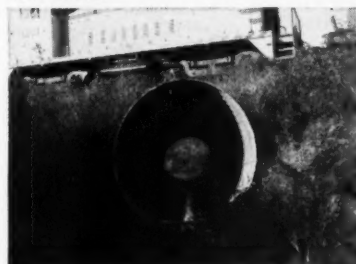
Liner Plate forms railroad underpass for school children.



Armco Pipe as utility conduit is being jacked through fill.



MULTI-PLATE Pipe installed for drainage under new railroad.



You can do it quickly and easily with a durable Armco metal product

It often happens that a tunnel, conduit or underpass is required through a railroad fill. Usually, the best solution is an Armco Liner Plate structure. The reason? Pound-for-pound, Armco Liner Plates are the strongest made. And the installation can be made without disturbing the safety and movement of surface traffic.

Assembly is simple; all bolting is from within the structure. One man can carry, handle and install plates. Installation keeps pace with excavation. Armco Liner Plates are supplied in a wide selection of sizes and shapes.

Depending on conditions and size requirements, Armco Corrugated Metal Pipe or MULTI-PLATE® Pipe may also be utilized for tunnels or conduits through railroad fills. Installation may be open-cut, or by jacking. Wide range of sizes.

These structures may be installed by railroad forces. Or can be handled as a complete installation through Armco's construction facilities.

* * *

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CONVENTION PROGRAMS

Bridge & Building Sessions



W. H. Huffman, President

Monday afternoon

(Beverly Room)

- 2:00 p.m.—Address by President W. H. Huffman
- 2:15 p.m.—Recognition of past presidents
- 2:30 p.m.—Report of Committee on Housing Problems of Bridge and Building Forces—H. M. Wilson, chairman (supervisor structures, Pennsylvania, Chicago)
- 3:00 p.m.—Report of Committee on Trends in Trestle Design and Construction—J. A. Goforth, chairman (maintenance engineer, Clinchfield, Irwin, Tenn.)
- 3:45 p.m.—Address on Uses of Prestressed Concrete in Railway Bridges and Buildings, by L. P. Nicholson, railway representative, Structural and Railway Bureau, Portland Cement Association—Illustrated by slides
- 4:30 p.m.—Adjourn

Tuesday morning

- 9:30 p.m.—Report of Committee on Extended Service Life for Masonry Structures—O. E. Fort, chairman (assistant chief engineer, maintenance, St. Louis-San Francisco, Springfield, Mo.)
- 10:15 a.m.—Report of Committee on The B&B Forces and the Federal Highway Program—M. J. Hubbard, chairman (assistant chief engineer, Chesapeake & Ohio, Huntington, W. Va.)
- 10:45 a.m.—Panel discussion on New Trends in B&B Mechanization—R. L. Fox (moderator), process engineer structures, Southern, Washington, D. C.; W. E. Chapman, chief engineer—maintenance, Central of Georgia, Savannah, Ga.; J. V. Inabinet, general bridge inspector, Seaboard Air Line, Jacksonville, Fla.
- 12:00 noon—Adjourn

Wednesday morning

- 9:30 a.m.—Report of Committee on Dieselization and the Water Service Man—J. H. Stinebaugh, chairman (supervisor water service and roadway machinery, Illinois Central, Carbondale, Ill.)
- 9:50 a.m.—Report of Committee on Attracting and Training B&B People—R. D. Bisbee, chairman (division engineer, Panhandle & Santa Fe, Slaton, Tex.)
- 10:10 a.m.—Business session
Election and installation of officers
- 11:00 a.m.—Adjourn

Wednesday afternoon

- 12:15 p.m.—Buses will leave the hotel for plant in La Grange, Ill., of the American-Marietta Company. Production of prestressed concrete beams and modern concrete pipe manufacturing plant will be inspected. Box lunches will be served en route, and buses will return to hotel about 4:00 p.m.

Roadmasters' and American Railway

September 15-16-17,

Joint activities featured by

Monday morning, September 15

(Williford Ballroom)

- 10:00 a.m.—Invocation by Dr. Kenneth Hildebrand, pastor, Central Church
Welcome by presidents of Roadmasters' and B & B Associations
Greetings from B. R. Meyers, president, American Railway Engineering Association
Greetings from President A. J. Reading of Track Supply Association
Greetings from President R. E. Mann of Bridge & Building Supply Association
Remarks by Lewis Thomas, secretary-treasurer, Track Supply Association
- 10:30 a.m.—Address on Our Railroads—Past, Present and Future, by Clark Hungerford, president, St. Louis—San Francisco, St. Louis, Mo.
- 11:00 a.m.—Address on Railroad—Men, Methods and Materials, by R. G. May, vice president, Operations and Maintenance Department, Association of American Railroads, Washington, D. C.

Activities of supply groups

The two associations of supply companies whose interests are identified with those of the Roadmasters' and Bridge & Building Associations have been far from idle this past year. These two groups—the Track Supply Association and the Bridge & Building Supply Association—have been working in the closest cooperation to finalize plans for the annual banquet they are sponsoring Tuesday evening, September 16, for the members of the two railroad associations and their families. Because of the success of the plan adopted last year for assigning table numbers when banquet tickets are obtained, this arrangement will again be in effect.

However, the most important recent development involving the two supply associations is a plan, approved by the member companies of both groups, to consolidate them into a single organization to be known as the Association of Track and Structure Suppliers. The first meeting of the new association is scheduled to be held at the Conrad Hilton Hotel at 11:00 a.m., September 17, at which officers will be elected. One of its first projects will be to lay the groundwork for the exhibition that is to be held next year.



A. J. Reading
President
Track Supply Assn.



R. E. Mann
President
B&B Supply Assn.

Maintenance of Way Association Bridge & Building Association

Conrad Hilton Hotel, Chicago

major addresses, banquet

Tuesday afternoon

(Williford Ballroom)

- 2:00 p.m.—Address on Productivity—A Key to Prosperity, by C. J. Fitzpatrick, president, Chicago & North Western, Chicago
- 2:30 p.m.—Motion picture "Operation Fill," showing construction of embankment across Great Salt Lake, with commentary by H. M. Williamson, engineer maintenance of way and structures, Southern Pacific, San Francisco, Calif.
- 3:30 p.m.—Adjournment

Tuesday evening

(Grand Ballroom—Informal)

- 6:30 p.m.—Joint annual banquet of the Roadmasters' and Bridge & Building Associations—with the supply associations. The banquet tables will be numbered and all tickets will bear table numbers. If you wish to share your table with friends, be sure they are present when you get your ticket.

AREA committee meetings

It has become regular practice for certain committees of the American Railway Engineering Association to schedule their fall meetings to coincide with the Roadmasters' and Bridge & Building conventions. The committee members thus have an opportunity to attend any convention sessions featuring addresses or committee reports of special interest to them. This year a total of 15 AREA committees has scheduled meetings to be held during the conventions. These committees, together with the dates, times and places of their meetings, are:

Committee	Date	Time	Room
Roadway & Ballast	9-17	9:30 a.m. to 5:00 p.m.	PDR #18
	9-18	9:30 a.m. to 12:00	PDR #4
Rail	9-16	9:30 a.m. to 5:00 p.m.	PDR #2
Track	9-16	9:00 a.m. to 5:00 p.m.	PDR #4
Subcommittee 2	9-15	2:00 p.m. to 5:00 p.m.	PDR #3
Subcommittee 3	9-15	9:00 a.m. to 12:00	PDR #3
Buildings	9-16	9:00 a.m. to 5:00 p.m.	PDR #12
Wood Bridges & Trestles	9-16	10:00 a.m. to 5:30 p.m.	PDR #13
Masonry	9-16	9:00 a.m. to 5:00 p.m.	PDR #3
	9-17	9:00 a.m. to 5:00 p.m.	PDR #3
Engineering & Val. Records	9-16	10:00 a.m. to 5:00 p.m.	PDR #14
	9-17	9:30 a.m. to 12:00	PDR #19
Yards & Terminals	9-17	9:00 a.m. to 5:00 p.m.	L'w'r T'w'r
	9-18	9:00 a.m. to 5:00 p.m.	PDR #3
Economics of Ry. Location & Oper. Contract Forms	9-15	9:00 a.m. to 5:00 p.m.	PDR #14
	9-16	9:00 a.m. to 5:00 p.m.	Room 522
	9-17	9:00 a.m. to 5:00 p.m.	Room 522
Economics of Ry. Labor	9-16	10:00 a.m. to 5:00 p.m.	L'w'r T'w'r
Maintenance of Way Work Equip.	9-15	9:00 a.m. to 5:00 p.m.	PDR #18
	9-16	9:00 a.m. to 5:00 p.m.	PDR #18
Clearances	9-16	9:00 a.m. to 5:00 p.m.	PDR #10
Special Com. on Cont. Welded Rail	9-16	1:00 p.m. to 5:00 p.m.	PDR #19
Wat. & Harbors	9-16	9:00 a.m. to 5:00 p.m.	Room 523



E. L. Anderson, President

Roadmasters' Sessions

Monday afternoon

(Williford Room)

- 2:00 p.m.—Address by President Anderson
- 2:20 p.m.—Recognition of past presidents
- 2:30 p.m.—Presentation of honorary membership
- 2:40 p.m.—Report of Committee on Human Relations for Maintenance of Way Employees—C. R. Merriman, chairman (engineer maintenance of way and structures, CSS&SB, Michigan City, Ind.)
- 3:10 p.m.—Report of Standing Committee No. 2—Track—W. E. Chapman, chairman (chief engineer of maintenance, Central of Georgia, Savannah, Ga.)
- 3:30 p.m.—Report of Committee on What Are the Additional Duties and Responsibilities of Supervisors Due to Changes in Maintenance Practices?—J. H. Brown, chairman (asst. ch. engr., Frisco, Springfield, Mo.)
- 4:00 p.m.—Adjourn

Tuesday morning

- 9:30 a.m.—Address on the 75th Anniversary of the Roadmasters' and Maintenance of Way Association, by H. E. Kirby, past president
- 9:50 a.m.—Report of Committee on Methods to Reduce Number of Work Trains and Replacement of On-track Equipment with Off-track Equipment—J. E. Eisemann, chairman (dist. engr., Santa Fe, Amarillo, Tex.)
- 10:20 a.m.—Report of Standing Committee No. 1—Machinery for Maintenance of Way Work—N. E. Smith, chairman (div. engr., Milwaukee, Bensenville, Ill.)
- 10:45 a.m.—Report of Committee on Maintenance of Trackage in Hump Yards—B. H. Bobbitt, chairman (assistant division engineer, Milwaukee Road, Savanna, Ill.)
- 11:15 a.m.—Report of Standing Com. No. 3—Roadway—P. R. Matthews, chmn. (div. engr., C&O, Richmond, Va.)
- 11:30 a.m.—Description of an inspection trip over the QNS&L, illustrated by slides—T. F. Burris, ch. engr.—sys., C&O, Huntington, W. Va.
- 12:00 noon—Adjourn

Wednesday morning

- 9:30 a.m.—Report of Committee on Tight Rail versus Welded Rail—G. R. Collier, chairman (chief engineer, Gulf, Colorado & Santa Fe, Galveston, Tex.)
- 10:15 a.m.—Report of Committee on Advantages and Disadvantages of System versus Division Rail Laying Gangs—H. M. Williamson, chairman, (enr. m. of w. & s., SP, San Francisco, Calif.)
- 11:00 a.m.—Business Session—Election of officers
- 11:40 a.m.—Adjourn

Wednesday afternoon

- 12:15 p.m.—Buses leave for inspection trip to manufacturing plant of the Pettibone Mulliken Corporation.



OCTAGONAL concrete piles (above) were placed in pre-drilled holes backfilled with concrete. Prefabricated-steel control room surmounts precast-concrete equipment room (right).

Open-type support gives "See-through" . . .

To allow visibility for yard crews at ground level, new facility on the Western Pacific at Stockton, Calif., is supported by prestressed, precast concrete piles.

● The Western Pacific wanted to build a control tower at its yard in Stockton, Calif. The purpose was to provide an elevated vantage point for the yardmaster. But in designing a structure to serve this purpose, the roads engineering department was faced with this further stipulation: Build it so it doesn't obstruct the view of train crews at ground level.

"We wanted to erect the best possible elevated structure from the standpoint of practicability and effectiveness, especially one that would not restrict the visibility of yard

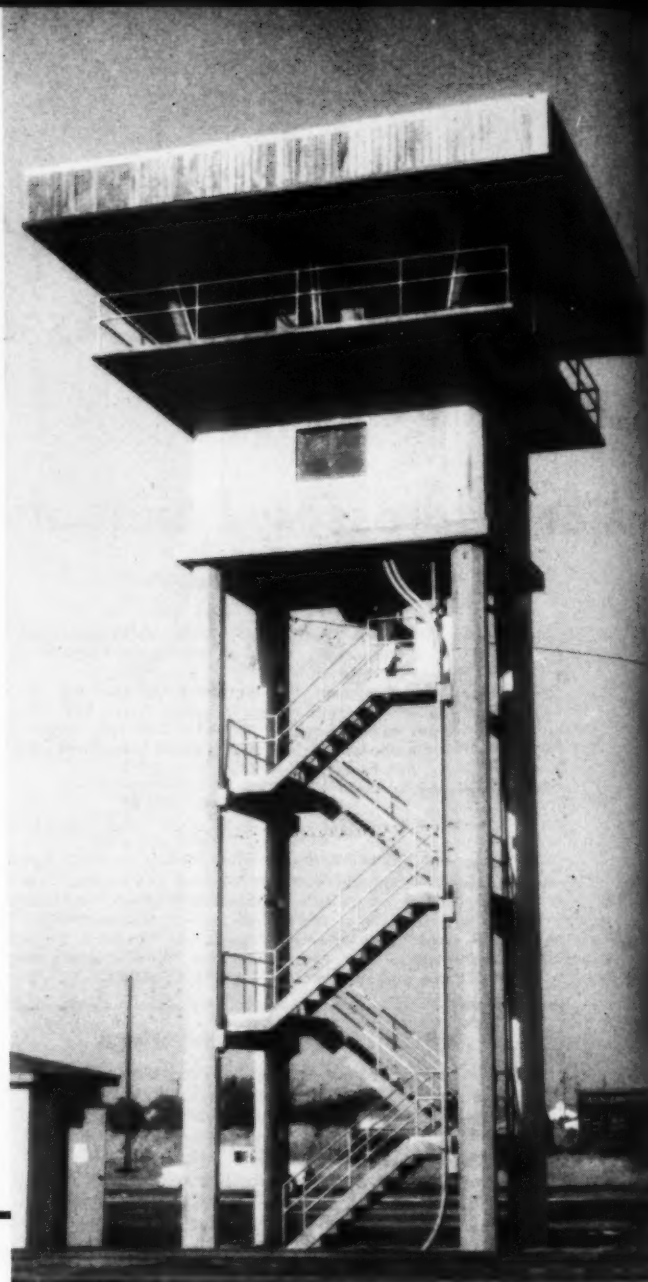
crews in watching over activities in the yard area," explained F. R. Woolford, the Western Pacific's chief engineer. The object was to place the tower in approximately the center of the yard so that the yardmaster could view the entire yard operation, in addition to a number of individual switching leads in the vicinity and the handling of cars out of the yard.

After investigation of various types of structures it was decided to adopt an open-type supporting structure utilizing prestressed precast concrete piles. Other interesting features

include an equipment room of precast concrete sections and a prefabricated steel-frame control room.

Details of control room

The 14-ft square control room is the topmost element of the structure. Its floor is 45 ft above the top of rail. This height was established as providing the optimum amount of visibility in all directions. The room is of welded steel-frame construction with a timber roof. The outward-sloping walls are framed with staggered steel-channel studs with roll insulation woven between them. The studs are welded to continuous steel channels forming window sills and base plates. The latter are anchored into the precast concrete floor slab.





TOWER gives maximum visibility of yard operations (above). Control room (below) is furnished with yard talk-back system and radio for contact with yard crews. Space for television is provided.



... tower for yardmaster

Jack studs above the windows are welded to steel-channel headers and to the bottom of wide-flange beams forming the roof frame.

Full visibility is provided by enclosing the entire perimeter of the room with double-glazed window sash five feet high. Metal lath and plaster are used above and below the windows both inside and outside.

The suspended ceiling is finished with an acoustical ceiling board for sound-proofing purposes. A built-up gravel roof is laid over an insulated steel roof deck. The roof has a wide overhang all around, with a deep fascia to afford maximum shade in the control room.

The floor slab extends beyond the exterior of the control room to provide a walkway on all sides that is

protected by welded pipe railings. The floor slab was covered with a linoleum wearing surface.

Below the control room is a 9-ft by 14-ft equipment room. The walls of this room consist of four precast concrete wall sections framing into a poured-in-place pilaster at each corner, all on top of a precast concrete floor slab. These walls also provide support for the control room above. Sanitary facilities are included on this deck.

The supporting structure consists of four 20-in octagonal prestressed piles, one under each corner of the equipment-room floor slab. Concrete beams framed into the piles support a stair structure between the legs. The stairs are also protected by welded pipe railings.

Due to the prefabricated nature of the structure, the piles had to be accurately placed. Since it was felt that the driving of the piles with the desired degree of accuracy would be extremely difficult they were installed in pre-drilled holes. These holes, made oversize, were drilled down to a stratum of such character as to afford adequate point bearing. The piles were then placed in the holes, properly aligned, and concrete poured around them to fill the voids and furnish lateral support.

All prestressed and precast concrete segments were hauled to the project from an off-site casting yard. The prefabricated control room was assembled on the ground adjacent to the tower by WP welders.

Goes up in 14 days

With the aid of a 25-ton rubber-tired crane, the tower was erected in 14 working days. In this work temporary track crossings were utilized so as to provide maximum crane maneuverability with a minimum of interference to yard operations.

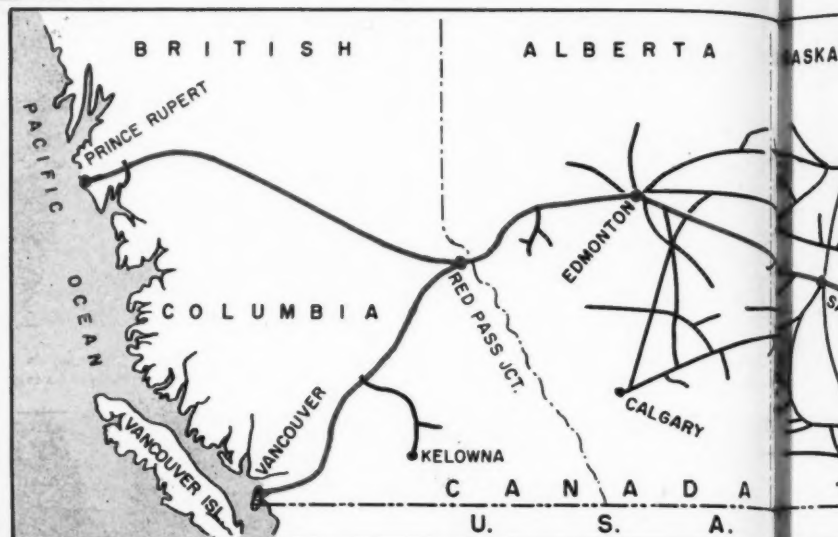
The control room is completely equipped to serve the yardmaster's needs without his having to leave the tower at any time during his period of duty. Contact with yard crews is maintained through a yard talk-back speaker system, as well as radio. Space was provided for expansion in event television is ever employed in the operation of the yard. Communication with the yard office is by intercom, telephone and a two-way pneumatic tube system. Air-conditioning was provided for comfort and increased efficiency.

Relocation of the yardmaster from the old location at ground level to the elevated tower site was performed with no interruption in his work or to yard operations.

Concrete prestressing, precasting and erection were handled by the Ben C. Gerwick Company under Western Pacific supervision. Except for the concrete members the structure was constructed by railroad personnel. The project was designed and constructed under the general direction of F. R. Woolford, chief engineer. Design work and preparation of plans were done under the supervision of A. W. Carlson, engineer of bridges and structures.



CRUSHED STONE is distributed by 15-car train near Anola, Man.



Upgrading track

The CNR is improving 1,940 miles of main-line road from the subgrade up to permit higher train speeds and to reduce maintenance. Work includes roadbed grouting, ditching, embankment widening, tie renewals and the placing of 12 in. of new ballast under the ties.

● One of the most ambitious track-improvement projects to be carried out in North America in recent years is now under way on the Canadian National. It contemplates the widening and strengthening of embankments, the widening of cuts, the application of an entirely new ballast section of crushed stone, and the extensive renewal of ties on 1,940 miles of main track. This betterment work extends over half a continent from Armstrong, Ont., west through the Manitoba, Saskatchewan, Alberta and British Columbia provinces, to Vancouver, B. C.

The main line betterment program is to be carried out over a seven-year period. Begun in 1956, it is scheduled for completion in 1963. It is aimed at conditioning the track for higher train speeds. It also is aimed

at a reduction in track-maintenance costs by upgrading the track and roadbed and by putting maintenance operations on a four-year cycle basis.

The roadbed work is being carried out simultaneously on each of the four districts comprising the Western Region of the CNR. The working season usually begins some time in April and ends in October. Each district presently employs from 200 to 250 men on this programmed work.

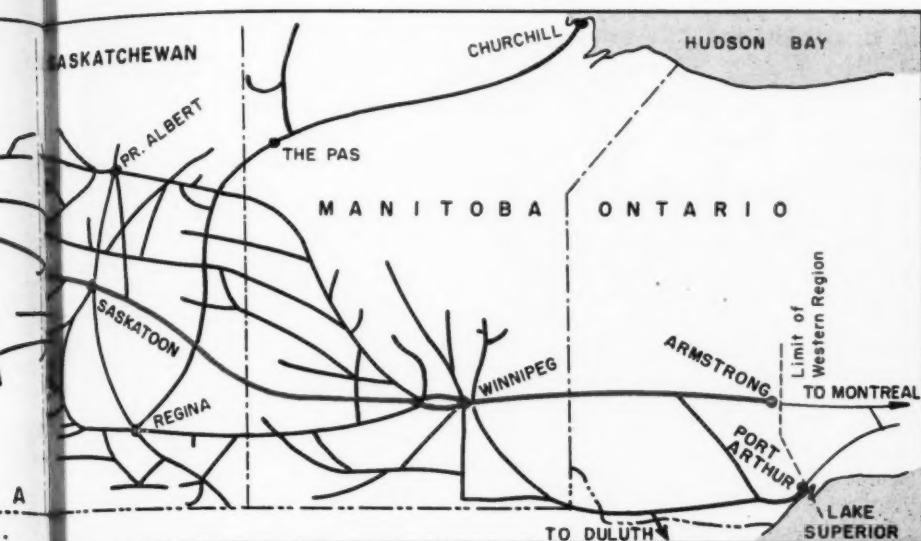
Preparatory work

The work pattern is much the same on all districts. First comes the preparatory work. This includes the widening of embankments to a minimum of 24 ft across the top, the extension of culverts, where necessary, with corrugated metal pipe, and the

grouting of unstable roadbed. It also includes the raising of the shorter bridges to conform with the proposed track raise, and ditching to improve drainage.

The embankment on 75 to 80 per cent of the mileage involved in the program must be widened. This work is being handled both by contractors and railroad forces. Where conditions are favorable, the widening material is taken from borrow pits or cuts and is placed by off-track earthmoving machines. Much of this equipment, with operators, is rented from local contractors. Where the use of off-track equipment is not practicable, the fill material is loaded into conventional air-dump cars, or side-unloading ballast cars, hauled in a work train, and dumped.

Correction of unstable subgrade



Vast nature of project is indicated by this map of CNR's Western Region. Heavy line shows trackage involved.



PREPARATORY work included an extensive program of roadbed stabilization. In the view above a dragline widens a cut. Below a tractor-shovel excavates a heave spot.

Track across half a continent

comprises another aspect of the preparatory work. Spots where the maintenance forces have difficulty in maintaining surface, or where excessive heaving has occurred in winter, are corrected either by grouting or replacement of subgrade material. A gang of 16 men and a Fairmont grouting outfit on each district maintains a progressive program. This gang also grouts embankments where a tendency to slide has been noted.

At some locations, such as where old trestles have been replaced by fills, cross drains are installed to tap water pockets. Perforated metal pipe drains are installed with the aid of a Ka-Mo earthboring machine. At other locations where soft spots exist, or where there are records of excessive winter heaving, the subgrade will be excavated for a rail length or so by a bulldozer and front-end loader to remove all unstable material. The excavation is then back-filled with gravel.

The preparatory work was started on each district in 1956, the first year of the six-year project. The ballasting work was not started until the next working season. This plan enabled the ballasting work to proceed on an out-of-face basis without any conflict with the preliminary work.

The next step of the work pattern takes place in the working season following the preparatory work. An undertrack sled of CNR design is introduced beneath the track and is towed by a locomotive for a quarter to one-half mile. The distance is determined each time by the number of cars of ballast on hand so as to minimize the duration of open or skeletonized track. This operation raises the track out of its bed, levels the existing ballast, and leaves the track skeletonized and about three inches higher than it was.

The CNR also has an undertrack plow of its own design, which is used at places where the existing ballast is undesirable and should be wasted. It is also used at locations where the track cannot be raised, as under overhead highway structures and at the longer railroad bridges or tunnels where a raise is not practicable.

At this stage of the work, all ties which do not appear to have more than four years of service life are removed. In addition, the ties are respaced to change the number from 22 to 24 ties per 39-ft rail panel. Approximately 800 new crossties are being installed per mile, 270 of which are additional ties. While many of the old ties are scrapped, a

sizable quantity of serviceable ones are reclaimed for placing under sidings and yard tracks.

Power machines are employed to speed up the tie work. Ties to be removed are first marked by the roadmaster and a Nordberg or Fairmont spike puller removes the spikes from them. A Gandy is then used to pull the old ties out of their beds and to insert the new ones; also in use is an RMC TieMaster. The tie plates are reapplied, spikes are set by hand and then driven by an RMC Spike-Master.

After the new crossties have been installed in connection with the initial sledding operation, a work train with as many as 15 cars, each loaded with about 40 tons of crushed stone, unloads the ballast. This material is



Upgrading track across half a continent . . .



THE TRACK is sledded several times to raise it on the old and new ballast.

levelled to the top of rail by a skid timber pushed ahead of the car wheels. The ballast is further distributed, and properly levelled, by a Jordan spreader-ditcher positioned just behind the last ballast car in the work train. A Kershaw Ballast Regulator follows behind equalizing the ballast on the shoulders. Then the ballast sled is pulled through this material by the locomotive, which results in the track being raised 6 in.

Sufficient additional ballast is unloaded to make a lift of 3 in. A Power Jack is used to make the raise; after which the track is held on track jacks until the first of two production tampers comes along. The ties are tamped, then a Kershaw Ballast Regulator is used to equalize and smooth the shoulders. At this stage of the work, the track is supported on a minimum of 9 in of new crushed stone.

Third season's work

The following year the track is given an additional 3 in lift. Sufficient crushed stone is unloaded to effect this raise of the track on new ballast; and the track is lifted, tamped and lined and surfaced. The

end result is a track having sound ties and a new ballast section 12 in deep under the ties, supported on a firm subgrade.

Each of the four district gangs has a Jordan spreader-ditcher, a Nordberg Power Jack, two production tampers, a track-lining machine and a Ballast Regulator. Four makes of production tampers are used over the region—Electrogang, Matisa, Plaser and McWilliams. Two types of track-lining machines are used, the Nordberg Trakliner and the RMC LineMaster.

Crushed stone ballast is produced and stockpiled by contractors at 16 locations between Armstrong and Vancouver. Maximum size of the stone is specified at 2 in. In some prairie areas, where no rock is available, crushed gravel ballast is accepted. This material is cleaned, washed, 60 per cent broken, and sized between 1 3/4 in maximum and 3/4 in minimum. Ballast requirements average about 3,450 cu yds per mile.

Work force now 950 men

When the preparatory work was begun in 1956, about 110 men were employed on this project. The following year, when the sledding, tie installation, raising and ballasting work were added to the preparatory work, the number of men was increased to approximately 850. In 1958, the operation of making the final 3 in lift was begun and the labor force engaged on this project averaged about 950 men. This number will be maintained until all of the preparatory work is completed in 1960.

The men are housed in regular standard on-track outfit cars. Many of the bunk cars, each accommodating eight men, are equipped with electric lights and oil heaters. Each gang is complete with all necessary types of units comprising cook, diner and supply cars, some equipped with electric or gas refrigeration. A car is provided for washing up and laundry service.

Before the work commences each working season, the extra gang jobs are bulletined. This year many of the men chosen as track-machine operators attended a school for two weeks at the start of the working sea-

son. They were instructed on the operation and care of their machines. The classes were held in an unused roundhouse and tracks were available so that the men could operate the machines under actual track conditions.

With this pattern of operations, the work is carried out on each district in 80-mile increments during each working season. Thus, in the first year 320 miles of preparatory work were completed on the Western Region. During the second year 320 miles of preparatory work and 320 miles of the 9-in track raise were completed. For the third year (1958), 320 miles of the final 3-in lift will be added. This procedure continues until each of the three phases of work has been completed for the 1,940 miles.

Programmed work is also being carried out on the 685-mile main-track connection in British Columbia between Red Pass Junction and the northern ocean port of Prince Rupert. On this line 80-lb rail is being replaced with 100-lb rail, and in other aspects the ballasting and related operations are similar to the major main line program, except that good pit-run gravel is being used as ballast.

Concurrently with the heavy betterment work, there is a heavy yearly rail relay program of approximately 500 miles over various locations on the region, including the main line.

Coincident with the track-betterment schedules, and related to dieselization, and operation of longer and faster trains, is the near completion of a heavy program of passing track extensions, terminal yard re-arrangement and expansion, new diesel shops, repair buildings, diesel fueling facilities, and extensive and progressive installation of CTC signaling on the main line.

"The work of these projects is progressing on schedule," said B. Chappell, regional chief engineer of the far flung 12,000-mile Western Region. "The complete mechanization of our gangs and full utilization of work equipment and cars has enabled us to carry out this heavy betterment program, and at the same time keep abreast of the needs and projects not only on our main line but on the remaining secondary and lighter traffic lines of the Western Region."



Low-cost coating job on long viaduct

Economies result from these three features:

- Aluminum-pigmented coating requiring a minimum of surface preparation
- Spray equipment of internal-mixing type to reduce "overspray"
- Air-operated "spider"-type staging with adjustable features

● Painters have just finished coating one million square feet of surface on the Chicago & North Western's steel viaduct over the Des Moines river near Boone, Iowa. What makes this project noteworthy is that the work was done at 40 per cent of the cost of painting this structure under conventional methods. A crew, consisting of a foreman and eight men, covered the bridge in 15 weeks.

The bridge is designated No. 615 by the railroad. But it is known locally as "the longest and highest double-track railroad bridge in the world." It is 2,685 ft long and its height above the ground averages about 128 ft. Its greatest height is 187 ft. It is comprised of 18 tower spans of 45-ft deck-plate girders, 21 deck-plate girder spans 75 ft long, and one 300-ft deck-truss span. It was built in 1901 and was last painted with red lead and a standard black oil-base bridge paint. Fourteen spans were so painted in 1948 and the remainder in 1941 and 1938.

Because of the length and height of this viaduct, the road realized that the cost of painting the structure would be substantial. A new protective coating, formulated by the Dearborn Chemical Company, offered the possibility of effecting considerable savings on the surface preparatory work. It was said to adhere well to old paint and required only the removal of loose rust and other extraneous material. The latter was accomplished with a scraper welded to an air nozzle, eliminating the need for flame cleaning, chipping and scaling tools. Also, the removal of the flaked old paint could be done during the same pass of the staging required for applying the new coating. These factors contributed to the road's decision to use this material.

It is designated No-Ox-Id A-Z and is an aluminum-pigmented, drying-type coating, with a specific vehicle designed for one-coat spray application. It met the railroad's desire

for a coating that would set up in a few weeks.

Another characteristic of No-Ox-Id A-Z is that it is thixotropic. In other words, it is a jellied substance unless it is shaken or agitated. It then becomes fluid.

Powered staging adopted

On a job of this magnitude the railroad felt that large savings in labor could be made if modern riggings were used. From past experience, it knew that more than half of a paint crew's time is spent in moving and adjusting bo'sun's chairs, swing stages, temporary platforms and kick planks. What the road wanted was a lightweight powered scaffold which could be quickly raised and lowered and easily moved from one place to another by workmen as desired.

The scaffolding adopted is a relatively new type. Manufactured by Spider Staging, Inc., Renton, Wash., it consists of open cages made of

Powered stagings were raised and lowered by cable drums actuated by air motors beneath the floors of the cages at ends of platform.

THE BRIDGE, 2685 ft long, is known locally as "the longest and highest double-track railroad bridge in the world." Average height: 128 ft.



Low-cost coating job . . .



aluminum-alloy tubing. Each cage is raised and lowered on a single wire cable winding on a drum driven by an air motor beneath the cage floor plates. It has a capacity of 1,000 lb and is 28 in by 36 in. in area and 5 ft 9 in high. The motor operates very well at 30 cfm of air at 100 psi.

The North Western purchased several of these powered stagings, six of which were used for coating the viaduct at Boone. It also purchased several adjustable platforms, three of which were used at Boone. By removing or adding sections these platforms can be adjusted in length from 10 to 25 ft. The end sections are telescopic for a distance of 2½ ft. The six cages at Boone were used in pairs, with a platform between them, forming three complete platform stagings. They can be raised and lowered at speeds varying up to 30 ft per min.

"Low-mist" equipment used

Further labor savings were effected by applying the coating with spray equipment instead of with brushes. After consultation with the Binks Manufacturing Company, and several trial runs with the new coating material, the type of equipment and supply arrangement were decided upon.

Several considerations were involved in the selection of equipment.

One was the loss of material through misting. The bridge at Boone is subject to almost constant wind. Hence, guns with low misting qualities were needed. For this reason, it was decided that relatively low air pressure and a spray gun having an internal-mix nozzle (air and material mixed before leaving gun) would produce minimum material travel and misting. It was also decided that guns with large material orifices eliminated plugging and delays from cleaning. The spray guns decided upon were Binks Model 18 pistol type and Model 24 extension type, both having internal-mix nozzles.

Another consideration was the necessity of providing for the constant supply of compressed air needed for powering the three platform stagings, blow guns, spray guns and material-handling pumps. The supply lines must be flexible so as to move with the scaffolds. Also, with all of these units drawing air for power, a reservoir was needed to maintain a relatively uniform pressure.

Air line serves as reservoir

An air hose drop line extended to each platform staging. These hoses ranged up to 200 ft long, and were provided in increments of 50 or 100 ft. This permitted adjustments in length to be made for the various tower heights. A main air-supply line



SUPPLY DRUMS of coating material were placed on fire-barrel platforms. Drum covers were fitted with material pump, air regulator and agitator.

Staging, other equipment pa

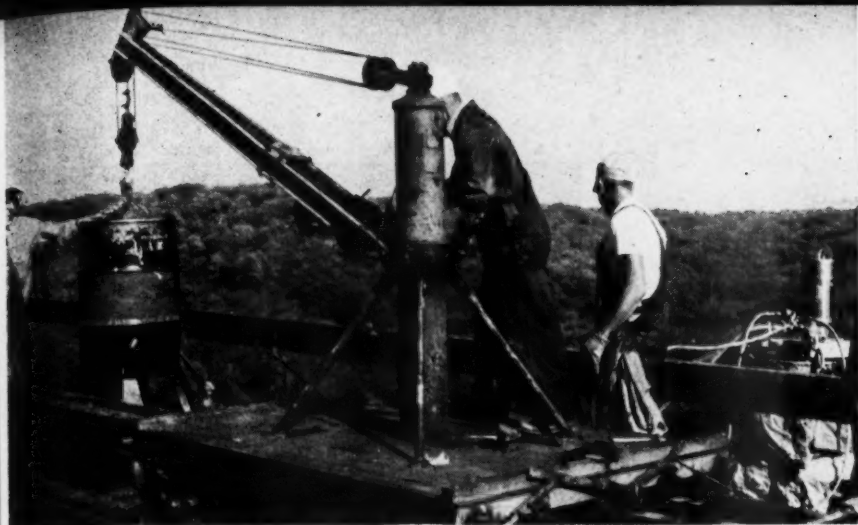
THREE platform stagings were used. Two were positioned transverse to the tracks and one parallel with the tracks.

was laid along the deck of the bridge. This was 1,000 ft long and of 2-in pipe, and it served a dual purpose. In addition to serving as a delivery line its length and size gave it the capacity of an air reservoir for maintaining pressure. Also, it supplied air at outlet-valve connections spaced every 200 ft and at the ends.

To provide connections at more convenient intervals than 200 ft, a portable manifold of 1-in pipe was used. This was 200 ft long and had valve outlets every 40 ft and at the ends. A hose 50 ft long was then used to connect the midpoint of the portable manifold with the nearest outlet valve of the main air-supply line. A drop line hose for each staging was attached to the most convenient outlet of the manifold, looped over and tied with rope to the viaduct railing to prevent pinching, and run to the staging.

At each staging the air-supply drop line was led to one of two tees at the midpoint of a ½-in pipe line placed on one side of the platform. The ½-in line supplies air to the motors of the powered staging at each end of the platform. The air was passed through a cleaner and then an oiler before it reached the air motors of the staging.

From the second of the two tees, a line ran to an air regulator and gauge which control the atomizing of two spray guns. The latter were each connected to a separate cock on the air regulator by 20 ft of hose. The regulator supplied the guns with 30 lb pressure which usually is sufficient when internal atomization is used.



DERRICK CAR was used to handle the 55-gal drums which weighed 400 lb. Coating material is thixotropic and must be stirred to keep it in fluid condition for pumping to spray guns.

paid for itself on this project

Air was also needed for blow pipes used while scraping the rust and extraneous material from the steel surfaces. The air was drawn from a cock introduced between the cleaner and oiler of each cage of the staging. It then passed through 20 ft of hose to a blow gun. The latter was a short length of pipe at the end of which a $\frac{3}{8}$ -in by 3-in chisel had been welded. It was light enough to be held in one hand while scraping loose paint.

At the beginning of this project, air was supplied by three 125-cfm and one 105-cfm Tractairs. They were stationed under the viaduct and were connected to the main air-supply line. Later, when the railroad had use for these units elsewhere, they were replaced by a 365-cfm compressor. This was placed at track level at one end of the viaduct. When the work had progressed from the east to the midpoint of the viaduct, the compressor and the 1,000-ft main air-supply line were moved to the other end of the structure.

How material was supplied

Another consideration was to provide an adequate supply of the coating material at each of the three platform stagings.

The material was furnished in 55-gal open-head steel drums. It has the consistency of shaving cream and must be agitated to reduce it to a fluid state. The railroad also found that, after the drums had stood over a week end when temperatures were below 40 deg, it was expedient to warm the material. This was done

by using an electric band heater for 15 min with power supplied by a Jackson 115-volt electric generator, placed between tracks on the deck.

The material was pumped from the drum by a Binks 8-to-1 material-handling pump mounted on a cover designed to fit the top of the drum. Also mounted on this cover were a regulator, which controlled the air pressure of the pump, and an agitator which kept the material in a fluid state.

Replenishing supply drum

When the drum needed to be replenished with material, another full drum was brought out and set alongside the first by a derrick car. An agitator was slowly introduced into it to reduce the material to the fluid state. At the same time, a transfer pump was placed in the drum to pump the fluid from the bottom and deposit it at the top. When the material had been fluidized, the spout of the transfer pump was turned and the material pumped into the supply drum.

The material-handling pumps forced the material from the supply drum through 50 ft of $\frac{3}{4}$ -in heavy-duty hose to another portable manifold. Like the one for the air supply, it was a 1-in pipe 200 ft long having the inlet at its center and outlet valves every 40 ft and at each end. A $\frac{3}{4}$ -in heavy-duty hose delivered the material from the manifold to a pipe tee on the platform staging. This tee branched to carry the material through 25 ft of $\frac{1}{2}$ -in hose to each of the spray guns.

The paint crew consisted of a foreman, six painters (working two each on the three platform stagings), and two laborers. The latter worked at the compressors, heated and moved the drums, agitated the material, replenished the material supply drum, and assisted in moving the rigging.

Usually, two of the platform stagings were worked parallel with the tracks and the other one transverse to them. The painters on the parallel stagings coated the outer surfaces of the girders, tower legs and diagonal bracing. Long rollers were fitted to the cages of this staging to facilitate movement along the inclined legs of the towers. The painters on the transverse stagings covered all inside surfaces beneath the deck of the girders. The material was applied with a coating thickness of $\frac{1}{48}$ inch on the vertical surfaces and slightly thicker on the horizontal surfaces subject to brine drippings.

Has anti-back lash device

Each of the cages of the stagings was equipped with a wire-rope tension-holder device. When the stagings were let to the ground and the rigging hooks were relocated, the tension-holder device prevented backlashes and kinks while the wire rope was being wound on the drum.

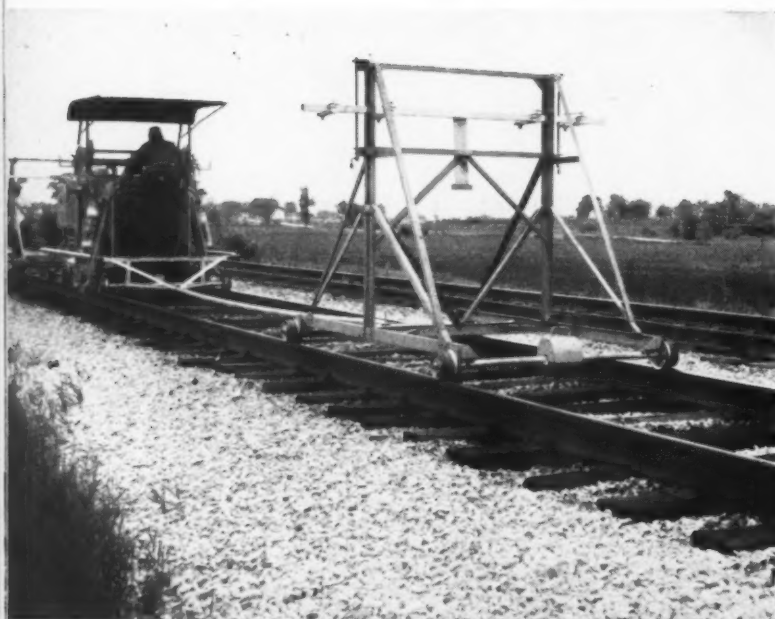
After the entire steel structure from the deck down to the pedestals had been coated, the steel on top of the viaduct was coated. This included the top flanges of the girders between ties, the metal posts and handrails, and guard rails.

For this work the road used one of its Tractairs having flanged wheels. Operating on the rails it towed a push car on which a material-supply drum and spray equipment were mounted. Four painters with spray guns completed this work.

The work was begun May 15, 1958 and was scheduled for completion August 29.

"We know that we will have to go back and do some spot painting," said M. S. Reid, engineer maintenance of way, under whose direction this work was carried out. "But, we won't have to do an out-of-face painting job there again," he added.

"We spent a lot of money for equipment on this job," said B. R. Meyers, chief engineer. "But, we also saved more than enough money to pay for it on this job."



TRAK-SURFACER, as adapted for smoothing, in operation during demonstration on North Western. Front carriage is in foreground.

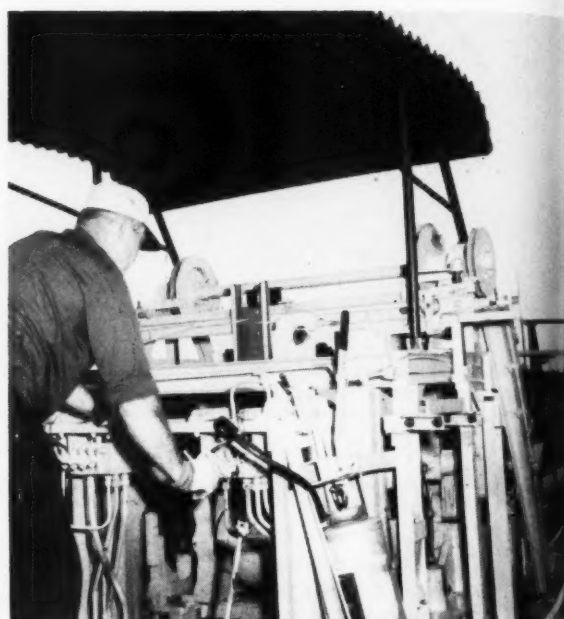
With the length shortened from 125 to 50 ft, this equipment, originally developed for out-of-face work, can now be used for picking up low spots and holding them for tamping. In demonstration on North Western, 3½ miles of track were smoothed in 14 working hours, using three machines and four men, plus the foreman.

● Track smoothing, or spotting, work can now be done by a method based on the use of a wire for doing the "sighting." The equipment used is an adaptation of the Nordberg Trak-Surfacer which was developed for use when giving the track an out-of-face raise.

In the Trak-Surfacer the wire is stretched between front and rear four-wheel carriages held a distance of 125 ft apart by a series of two-wheel buggies. The track is raised, and a tie is tamped at each jacking point to hold the raise, by a Tamping Power Jack placed 25 ft ahead of the rear carriage. The reference line for the raise is provided by the wire which passes over both sides of the jack, directly over the rails.

At the Tamping Power Jack each wire is in contact with a pointer mechanism in which the two pointers move on a scale placed in front of the operator. When surfacing track only the pointer in contact with the wire over the grade rail is used, the other being locked out of position. The amount of the raise to be given the track is determined by adjusting the setting of the wire on the forward carriage. At the Tamping Power Jack the amount of the raise required at a given point is indicated by the pointer in contact with the wire over the grade rail. The track is then jacked until the pointer is at zero. A level bubble, also placed in front of the operator, indicates when the track has been brought to the proper cross-level. The tie is then tamped to hold the raise.

To adapt the Trak-Surfacer for doing smoothing work only one major change is made in the equipment—the distance between the front and rear carriages is shortened to 50 ft. For this operation the Tamping Power Jack is placed 20 ft ahead of the rear carriage. The



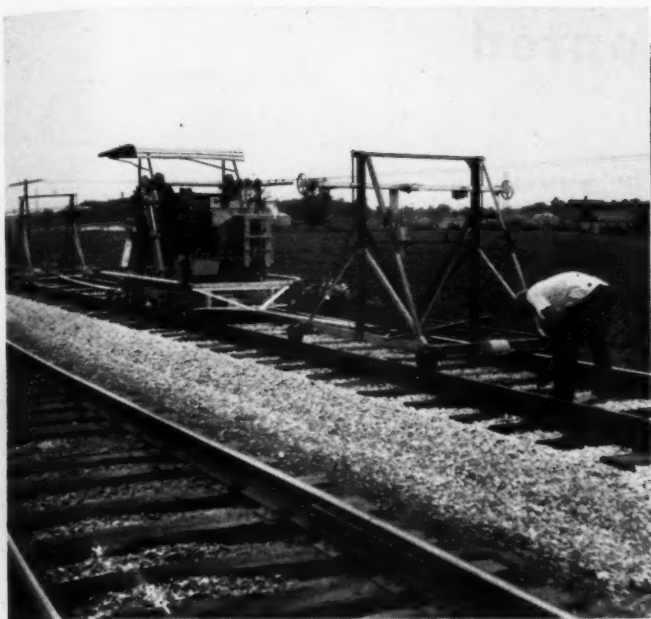
POINTERS on scale in front of operator indicate low spots on either side. Splashes of paint are used to indicate jacked ties.

"Wire" adapted for track

method of operation, however, is different in several important respects. For one thing the position of the wire at the front carriage is set at zero, so that it is at the same height above the rail (60¼ in) as the setting at the rear buggy. For another, the pointer mechanisms for both wires are used. The reason for this is to make it possible for the operator to detect low places in both rails by observing the two pointers.

How used when smoothing

Here, in brief, is how the equipment is used when smoothing track: Propelled by the Tamping Power Jack, the assembly is moved along the track until a low spot is encountered in either or both rails as indicated by the movement of the pointers. (Through experience it has been found that the best all-around results are obtained when conditions in the rail surface that are not over ¼ in low at the pointer are not disturbed.) The operator then moves the jack to the nearest joint, center or quarter, jacks up a tie as



FOLLOWING behind Trak-Surfacer a man marks ties to be tamped, using a code system to indicate whether they are to be tamped at one or both ends.



TAMPING in demonstration was done with Nordberg Gang Tamper (above) and lining with Line Indicator (below).



for track smoothing

necessary to correct the low spot by bringing the pointers to zero on the scale and then tamps the tie.

Splashes of paint are used to indicate the ties that have been jacked up and tamped. For this purpose two containers of paint are mounted on the jack, one on each side. By using a lever for each tank the operator can cause a spot of paint to be squirted on either or both ends of a tie, depending on whether the track has been raised on one or both sides.

Following behind the Trak-Surfacer a man, guided by the paint spots, marks the ties to be tamped, indicating how many are to be tamped on each side of the marked tie and whether they are to be tamped on one or both ends. The tamping is then done by a production tamper.

Why was 50 ft selected as the wire length for the Trak-Surfacer as adapted for smoothing? During the development period various lengths were tried out and the results observed. These observations led to the conclusion that a length of 50 ft, with the jack placed 20 ft ahead of

the rear carriage, would give a satisfactory quality of work on high-speed track. There is a definite reason why this arrangement proves advantageous. When the jack is positioned at a joint the rear carriage is at a joint that has been raised and tamped and the front carriage is resting on the track beyond the first joint ahead of the jack. Thus the effect of local irregularities is minimized.

Demonstrated on North Western

The Trak-Surfacer as adapted for smoothing was recently observed in operation during a demonstration in double-track territory on the Chicago & North Western near Milwaukee. It was working on the east-bound track in an eight-mile stretch that had been plowed with a Man-nix plow last year and raised on about 5 in of new crushed stone ballast. Equipment working with the smoothing machine consisted of a Nordberg Gang Tamper and a Trak-Liner.

Personnel of the gang, except for flagmen, consisted of three machine

operators, a man for marking the ties to be tamped (who also assisted in removing the Trak-Surfacer carriages when necessary to clear for trains) and a foreman. The man marking the ties was using a code system to indicate the ties to be tamped and whether the tamping was to be done at one or both ends. The tamper is of the split-head type and two insertions were made at each tie tamped, whether at one or both ends.

During the last four days of the demonstration the organization smoothed 473 rail-lengths of track (approximately $3\frac{1}{2}$ miles) in 14 working hours. In this work 46.5 per cent of the ties were tamped. To arrive at this figure the number of ties tamped, whether they were tamped at one or both ends, was totaled up and figured as a percentage of the total number of ties in the $3\frac{1}{2}$ -mile section.

The manufacturer states that Trak-Surfacers now in service can be adapted for smoothing simply by introducing connecting tubes of different lengths directly in the front and rear of the Tamping Power Jack.

Why the D&RGW adopted a new rail section . . .

... and how it is performing in service

● It has long been my belief that there should be possible savings in rail costs with diesel operation through the use of a rail section designed to fit the type of operation we have. Through the cooperation of the Colorado Fuel & Iron Corp., a 106-lb section was developed which we feel will afford substantial economies in both tangent and curved territory.

The thought that prompted the D&RGW to consider the possibility of a rail section in the 100-lb-per-yd range is the realization that rail designs should be developed which will offer substantial savings. A further thought was the fact that, for diesel operation with the resultant lighter stresses in rail, there should be considered a new rail section for such operation, which would offer the possibility of considerable economies.

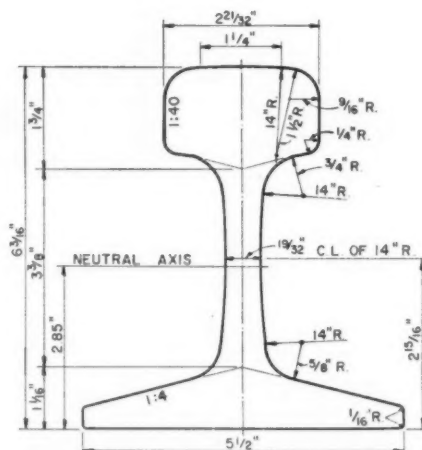
More specifically, in the design of the 100-lb section we were motivated, as was CF&I, by a desire to develop a rail section having improved structural design properties, which would be measurably comparable to the 112-lb RE and the 115-lb sections and superior to the 100-lb RE section. Having such properties, the new section, it was felt, would afford definite values in weight savings when compared with the heavier 115, 119, 132 and 136-lb sections.

When the new 106-lb section is compared to the 100-lb RE and the 119-lb CF&I sections, and to the 112-lb and the 115-lb RE sections, its physical properties are found to be most attractive. It compares favorably with the heavier 115-lb RE and the 119-lb CF&I sections, and is definitely superior to the 112-lb RE and the 100-lb RE Sections. The table gives a comparison of the physical properties of the different sections.

It is interesting to note that the new section has considerably less web stress than the 100-lb RE and the 112-lb RE sections. The com-

In 1956 the Denver & Rio Grande Western adopted and began using the CF&I 106-lb rail section. Why was it selected? What have been the results after two years of service? These and other questions are answered by Mr. McBrien in this article.

By Ray McBrien
Director of Research
Denver & Rio Grande Western



CROSS SECTION of the CF&I 106-lb rail. For properties see table opposite page.

parative web stresses as given in the table were calculated in accordance with the method described in the AREA Proceedings, Vol. 48, pages 987-991. The maximum web stresses incident to comparable loading indicates a 46 per cent greater stress in the 100-lb RE section than in the 106-lb section and a 21 per cent greater stress in the 112-lb RE than the new section.

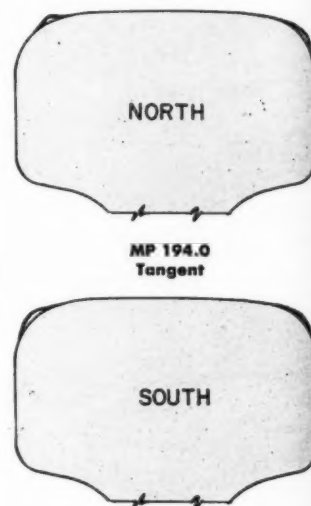
Based upon the physical properties of the rails considered for use by the D&RGW, it can be seen that this new 106-lb section as designed offers considerable merit for usage. It was adopted by our road in 1956. In that year 7.547 miles were laid,

Mile Post 194.03 to 201.50. In 1957 an additional 4.66 miles were laid, Mile Post 775.16 to 779.82.

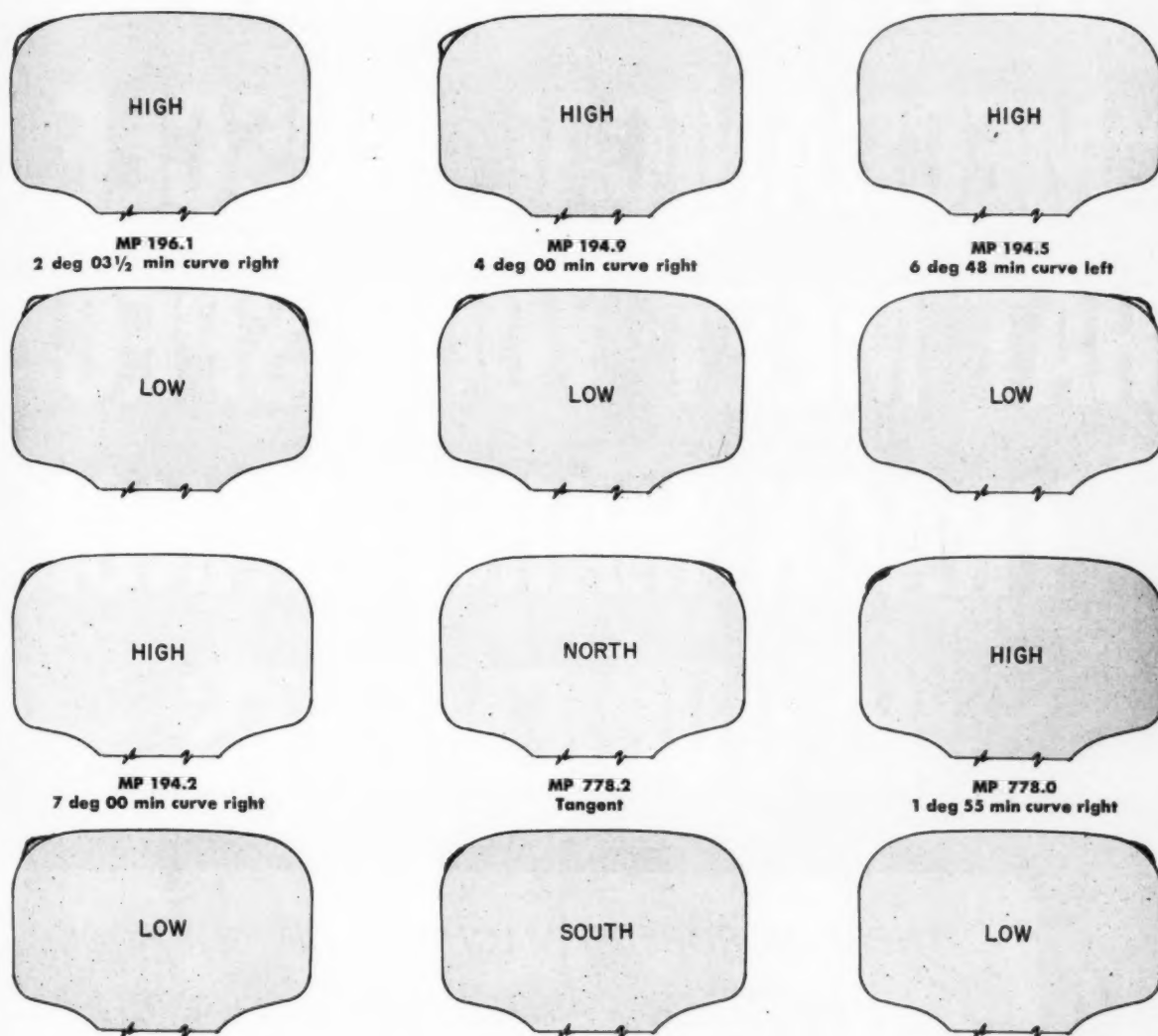
In the territory where the rail was laid in 1956, the maximum curvature is 7 deg and the maximum grade is 1.09 per cent. In the territory where the rail was laid in 1957 the maximum curvature is 1 deg and the grade 0.05 per cent.

Typical rail wear profile graphs taken at both installations in July 1958 are shown in the box. The wear pattern is practically nil; except for flow of the soft surface decarburized metal, no changes are apparent.

The 106-lb rail installed in 1956 has been in service 24 months and



These are reproductions of typical rail wear profile graphs of the 106-lb rail in service on the D&RGW. All the graphs were made in July 1958. The 106-lb rail in the vicinity of Mile Posts 194-196 was laid in 1956. That near Mile Post 778 was laid the following year. The 1956 rail has carried about 12 million gross tons of traffic and that laid in 1957 has carried about 5 million tons. Mr. McBrien is convinced the "rail is going to prove very satisfactory."



has had approximately 12 million gross tons of traffic. The rail profiles taken and inspection of the rail in track indicate that this rail is going to prove very satisfactory. The rail installed in 1957 has carried approximately 5 million tons of traffic.

This rail will be continually observed. However, it is our feeling that the use of this new 106-lb rail, with its excellent physical properties, will offer considerable savings, both in first cost and in actual usage. It also offers another economical rail section which can be utilized for secondary lines and for installations where secondhand rail is not available.

Comparison of properties of different rail sections

Item		119 CF&I	115 RE	112 RE	106 CF&I	100 RE
Area: (sq in)	Head	4.32	3.91	3.95	4.00	3.80
	Web	3.04	3.05	2.77	2.50	2.25
	Base	4.29	4.29	4.29	3.95	3.90
	Total	11.65	11.25	11.01	10.45	9.95
Weight per yard		118.8	114.7	112.3	106.6	101.5
G. T./mile		187.0	180.7	176.5	167.5	159.5
N. T./mile		209.4	207.4	197.6	187.6	178.0
Moment of inertia (vertical)		71.4	65.6	65.5	53.6	49.0
Section modulus, head		19.4	18.0	18.1	16.1	15.1
Section modulus, base		22.9	22.0	21.8	18.8	17.8
Ratio "I" to area		6.13	5.83	5.9	5.1	4.9
Ratio, sec. mod., head to area		1.7	1.60	1.6	1.5	1.5
Distance base to N. A. (in)		3.124	2.98	3.0	2.85	2.75
Maximum web stress (psi)		13,400	15,200	22,653	18,696	27,267
(20,000-lb load - 3/4 in eccentricity)						

NOW... 28 NORDBERG "MECHANICAL MUSCLES" THAT MEET YOUR SPECIFIC TRACK MAINTENANCE REQUIREMENTS

THESE NORDBERG MACHINES BRING PROGRESS TO TRACK MAINTENANCE OPERATIONS

The following machines, among the more recent Nordberg developments, are typical of the machines that have become the standard for efficient maintenance operations on the nation's railroads.

1. **LINE INDICATOR** . . . Makes possible quick, lower cost lining of curves and tangent track. Using the Nordberg Trakliner® as a central unit, this new machine does the complete job of sighting and lining track.
2. **GANG TAMPER** . . . 16-point tamping for raising or spot surfacing, this one-man machine tamps by impact, compression and vibration. Assures uniform quality tamping of every tie, every time, in any ballast.
3. **SELF-PROPELLED SPIKE PULLER** . . . Incorporating all the proved advantages of the regular Nordberg Mechanical Spike Puller, the new Self-Propelled unit now becomes a two-man machine that boosts man-hour production 50%.
4. **BALLAST ROUTER** . . . Easily and quickly removes high crib ballast, improves track drainage, and simplifies application of rail anchors.
5. **TRAK-SURFACER — TAMPING POWER JACK TEAM** . . . An entirely new method of producing improved profile and surface, the Trak-Surfacer employs a tightly drawn wire as a reference line for raising track. A Nordberg Tamping Power Jack, used as the central unit, raises the track to the wire, tamps the tie to hold the raise and provides propulsion power for itself and the entire Trak-Surfacer.
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From the time the first Nordberg Track Maintenance Machine was introduced over a quarter-century ago to the present day . . . America's leading railroads have made Nordberg "*Mechanical Muscles*" the standard by which modern maintenance machinery is compared.

Important, too, is the fact that all of the twenty-eight Nordberg "*Mechanical Muscles*" have been designed, built, tested and proved with the cooperation of railroad men.

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NORDBERG MFG. CO., Milwaukee 1, Wisconsin

Cost-Cutting Nordberg "*Mechanical Muscles*" include:

BALLAST ROUTER • BANTAM RAIL SLOTTING • CRIBEX® • BALLASTEX® • SCREENEX® • SPIKE HAMMER • TIE DRILL • HYDRAULIC and MECHANICAL SPIKE PULLERS • POWER JACK • POWER WRENCH • RAIL DRILL • RAIL GRINDERS • SURF-RAIL® GRINDER • TIE-KAT® • TRAKLINER® • TRACKSHIFTER • DUN-RITE® GAGING MACHINE and BRONCO • DSL® YARD CLEANER • GANDY® —TIE PULLER and INSERTER • GANG TAMPER • SELF-PROPELLED ADZER • SELF-PROPELLED SPIKE PULLER • TAMPING POWER JACK • TRAK-SURFACER • LINE INDICATOR

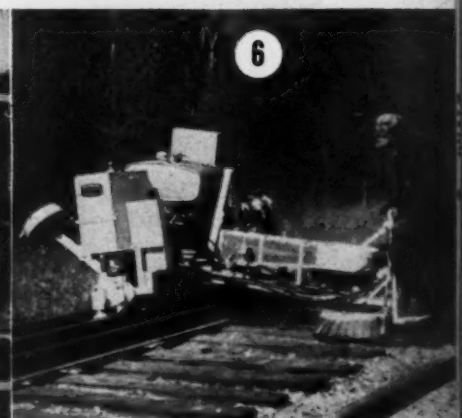
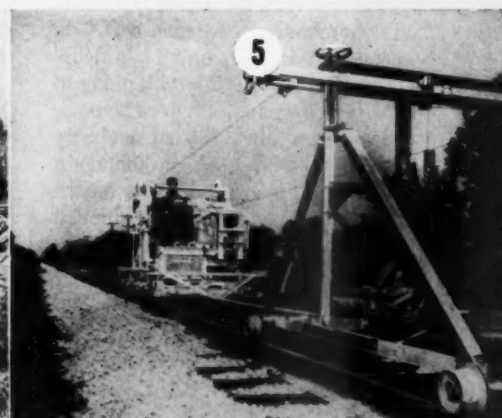
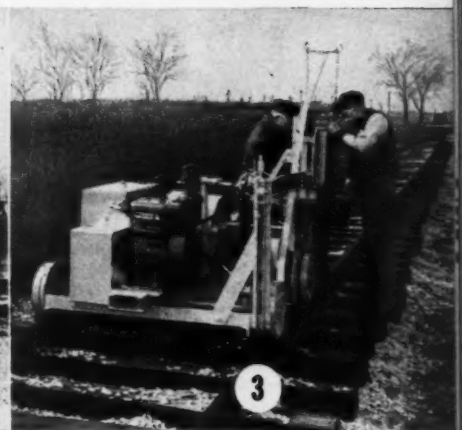


NORDBERG
Mechanical Muscles®



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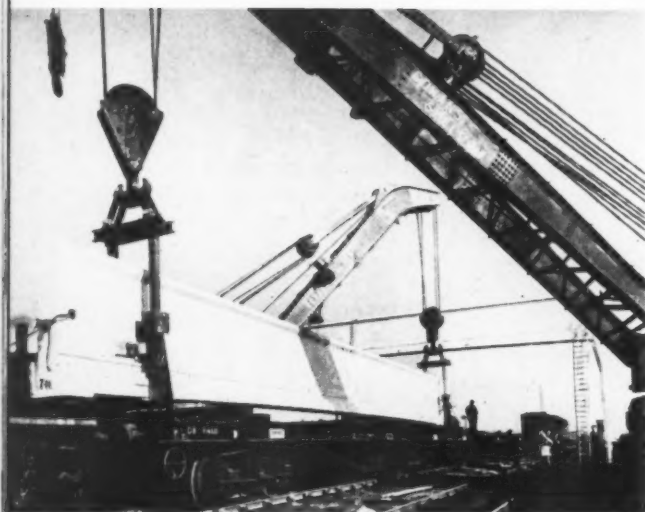
R857-R



All-concrete footbridge has . . .

Prestressed beams, precast bents

Prefabricated concrete bridge in England is brought to the site one span at a time for erection on Sundays. Spacers and long concrete beams are prestressed and floor panels and bents are precast.



SECOND of a pair of prestressed concrete main beams being lifted from the special train by two locomotive cranes. The lifting cradles were specially designed with a universal joint in each upright to avoid placing any strains on the concrete beams. They weigh between 30 and 35 tons each.



EACH MOVEMENT and swing of the locomotive cranes was marked out on the ground before positioning the beams to avoid mishandling. The structure under the center of the span was used to steady the beams during the operation. The holes in the main beam were used for post-tensioning the spacer beams by threaded steel bars.

● Structural designers on European railroads are using pretensioned concrete for a variety of structures. A recent project using such construction involved an all-concrete footbridge over 600 ft long. This structure crosses a railroad yard at Scunthorpe, England, on the Eastern Region of the British Railways, and provides pedestrians access between Scunthorpe and Frodingham.

The footbridge crosses 5 main and

22 yard tracks. The five spans of this bridge total 373 ft in length and they are flanked by 120-ft and 125-ft approach ramps, making a total length of 618 ft. The bridge has an overall width of 7 ft 4 in and a height of 6 ft. It provides a footway 5 ft wide and 5 ft deep, as measured from the top of walk to parapets. A clearance of 15 ft 7 in is provided above the top of rails.

Concrete has been used throughout. A metallurgical super-sulphated acid-resisting cement was employed with granite aggregates. This was used to produce a dense mix and a finish impervious to industrial fumes.

The main spans consist of pretensioned concrete beams 6 ft in depth, varying from 67 to 86 ft in length, supported on precast reinforced-concrete two-post bents. The bents are 19 ft high and about 15 ft wide at the base. The beams for the approaches are of reinforced concrete supported on bents of similar construction but diminishing in size from the bridge to the ramp ends.

Between each pair of concrete beams forming a span of both the bridge and the approaches, reinforced-concrete spacer beams, 4 ft 6 in long, 1 ft 9 in wide and 11 in deep, have been placed at intervals of about 8 ft. Each spacer beam was post-tensioned by four threaded steel bars passing through holes in the main beams and through the spacer beams themselves. The nuts were tightened to 125 ft-lb by using torque wrenches, and the spacer beams were then pressure grouted.

The deck of the bridge is formed of hollow pretensioned concrete floor units, each 4 ft 7 in long, 1 ft 2 in wide and 4 in deep, bedded in cement.

The bridge was produced in its various sections at the contractor's plant, then transported to the erection site. The bents supporting the bridge were cast as complete units and weigh between six and eight tons. The main beams weigh between 30 and 35 tons each.

The work was scheduled so as to erect a complete span each Sunday. The main beams were transported in pairs on a special train to arrive in time for each Sunday's work. The erection of each span averaged about 12 hr, using two locomotive cranes.

The bents were first erected, then the main beams were positioned. Considerable care was exercised to avoid jarring or creating stresses in the main beams during erection and handling, as there is tendency for them to crack under mishandling. Turning and twisting strains also were prevented during the lifting operations. This was accomplished by using special lifting cradles and incorporating a universal joint in the uprights.

To insure that the lifting and maneuvering operations were correctly carried out, the crane positions and arcs of movement were marked out on the ground. Positioning of the beams also was carefully done, and plumb lines were attached to the ends of the beams for checking purposes.



"Say . . . those guys don't let any grass grow under their feet . . . weeds or brush either!"

Chipman chemicals and application service are backed by over 45 years of railroad weed control experience. A broad line of weed, grass and brush killers is available. Each chemical or chemical combination is formulated for specific vegetation problems. Most widely used are these trade-name products:

Atlacide • Atlas "A" • Chlorax • Chlorea • Methoxone-Chlorax
TCA-Chlorax • Methoxone-Chlorea • Chipman Brush Killer

We can solve *your* weed problems with the *right* chemicals and application service. Check with us today!

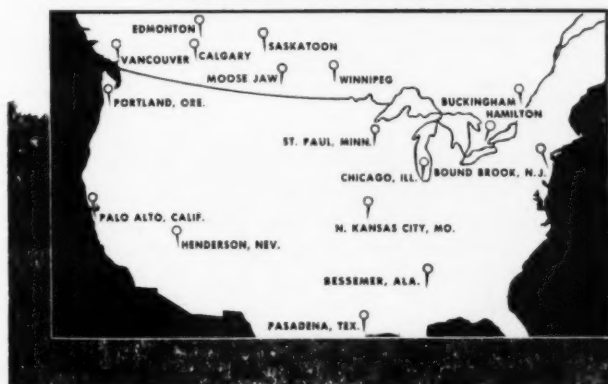
CHIPMAN

Chemical Company, Inc.

Bound Brook, New Jersey

Pioneer in Railroad Weed Control

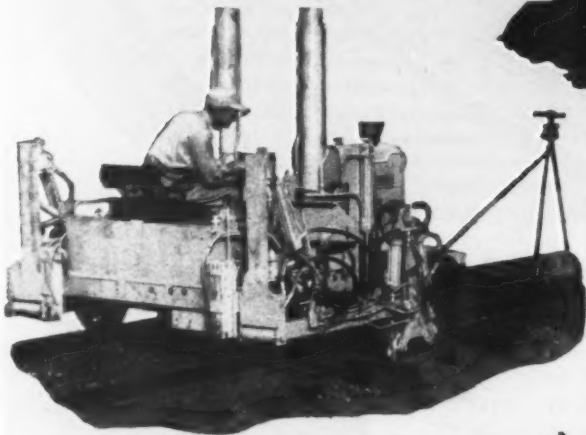
17 Strategically Located Chipman Plants



Maintain Operating Ratios

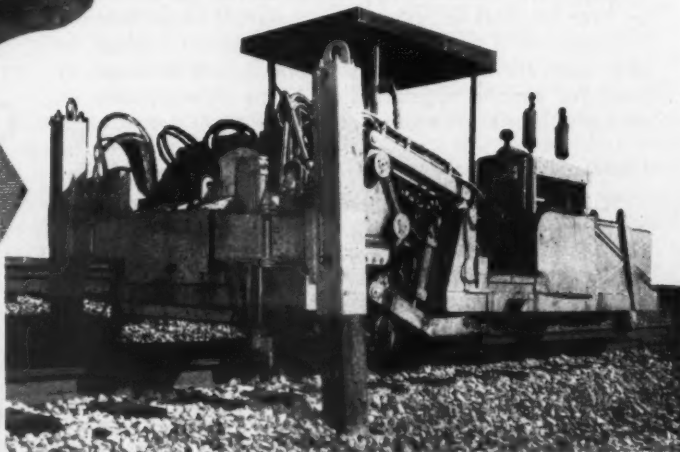
YOU, too, can maintain your operating ratios despite rising costs and declining revenues by utilizing these Kershaw machines. The savings in maintenance will be an eye-opener and you can pay for the machines out of your savings, often in the first year.

KERSHAW BALLAST REGULATOR may be used as a track patrol, with out-of-face surfacing gangs, or retimbering gangs. It also may be used to regulate, scarify, de-weed and shape the ballast shoulder. Kershaw has a Standard and a Heavy Duty Ballast Regulator to suit your needs.



KERSHAW SUPER JACK-ALL, tamps on the side of ties with both vibration and compaction. The machine has a 30-second raising and tamping cycle and has satisfactorily raised track ahead of two multiple tamperers.

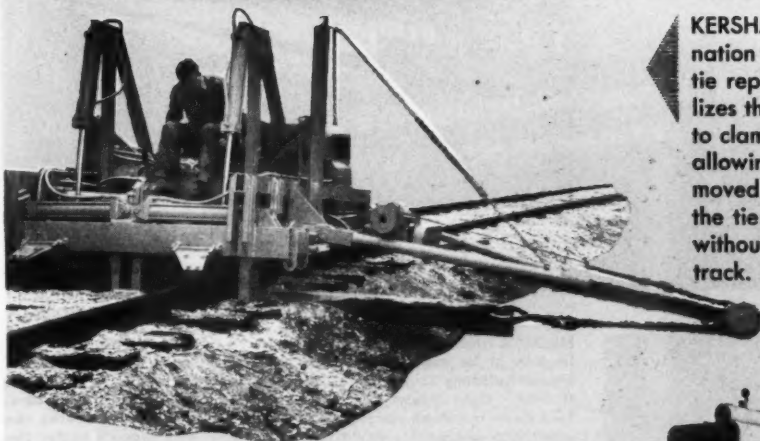
KERSHAW SPOT TAMPER combines the work load of a Jack-All and a multiple tamper to provide tamping on any railroad under any conditions, even through switches.



KERSHAW TRACK CRANE with **TIE INSERTER** redistributes new ties after they have been unloaded and picks up and stacks old ties. A new Tie Inserter attachment then is used to insert the new ties.

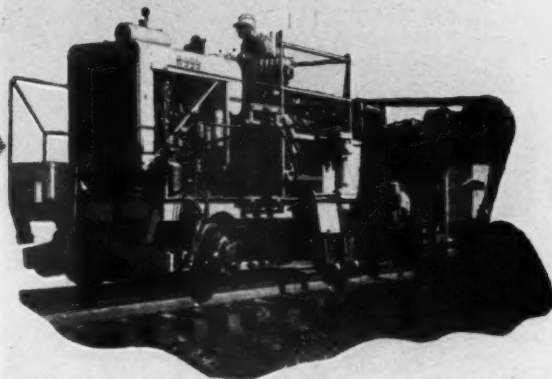
KERSHAW ... TRACKWORK EQUIPMENT

...with these Kershaw Machines!



KERSHAW TIE REPLACER, a combination tie remover, tie bed scarifier, tie replacer, and crib scarifier, utilizes the rams on the scarifier head to clamp the rail and raise the rail, allowing the tie to be easily removed. The machine then scarifies the tie bed and inserts the new tie without changing the surface of the track.

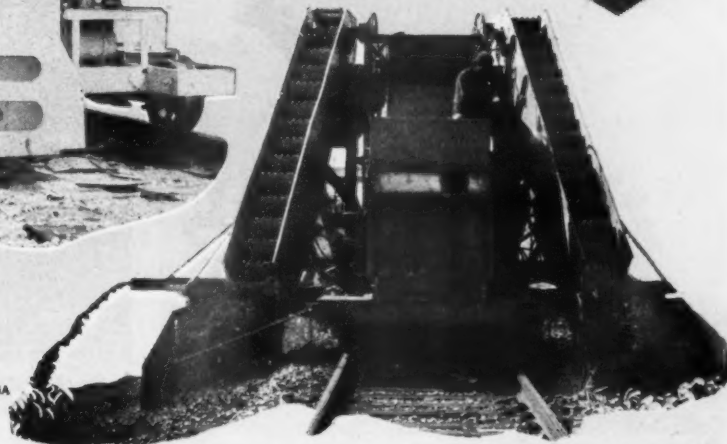
KERSHAW UNDERCUTTER AND SKELETONIZER is used in reconditioning gangs to skeletonize, or undercut and lower track.



KERSHAW CRIB-ADZE with Wood Preservant Attachment working off either rail cribs between ties, adzes the ties and sprays wood preservative all in one operation, at the rate of 100 feet per minute.



KERSHAW BALLAST CLEANER is used independently to clean shoulder ballast and also can be used in reconditioning gangs behind the Undercutter and Skeletonizer to clean ballast and return it to the track.



KERSHAW
MANUFACTURING CO. INC.



P.O. DRAWER 1711

MONTGOMERY, ALABAMA

DEVELOPED, TESTED AND PROVEN ON THE JOB!



MODERN and efficient ICI freighthouse has been built by the Burlington at its new Cicero yard, Chicago. The Butler steel rigid-frame building covers 340,000 sq ft and is 284 ft wide by 1230 ft long. Eight tracks are enclosed with a capacity of 184 cars. Two floor-installed conveyor lines pulling small freight trucks run along the platforms, down ramps and through tunnels under the tracks. A two-story brick office building extends across one end. The office utilizes the ground floor with the second floor devoted to lunch room, locker and lavatory facilities.



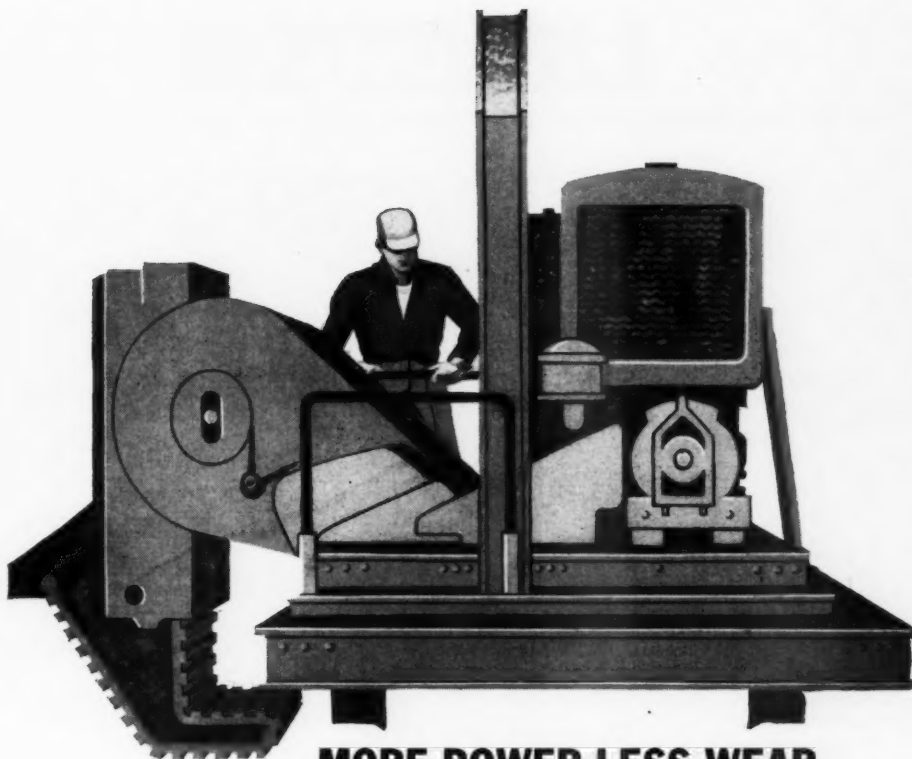
News briefs in pictures . . .



STRIPPING shovel dwarfs transit hoe at recent rendezvous to show size range of Bucyrus-Erie excavators. The River Queen is a 55-cu yd, 2400-ton shovel used to strip overburden above coal deposits. The hoe is a $\frac{3}{8}$ -cu yd, 11-ton crane-excavator.



GETS PAID for sleeping while other men earn their pay. Bargained into a job requiring no work this train service employee is a prime example of why railroads maintain that labor agreements should be revised to exclude featherbedding practices.



MORE POWER LESS WEAR

New Essolube HD offers outstanding detergency properties —plus improved oxidation stability and bearing corrosion resistance—for both gasoline and diesel maintenance-of-way equipment. This was proved in extensive laboratory and field tests prior to its introduction. Under *low*-temperature conditions, Essolube HD markedly reduced sludge deposits. And under *high*-temperature conditions, it reduced piston varnish and top ring deposits to a new low. ¶ Such outstanding all-temperature detergency keeps engines cleaner longer...increases power, reduces wear, lengthens time between overhauls

and extends engine life. ¶ Because versatile Essolube HD...is ideally suited for almost all maintenance-of-way gasoline and diesel engines, savings can be shown on inventory and handling. ¶ For the full story on new Essolube HD, call your local Esso office or write:

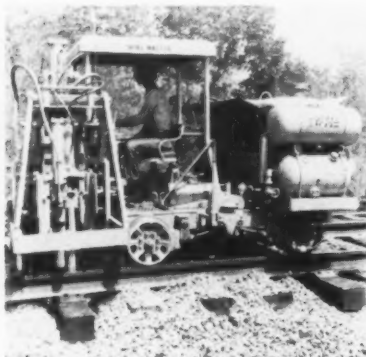
Esso Standard Oil Company, Railroad Sales Division, 15 West 51st Street, New York 19, N. Y.

perfected by research . . . proved in performance

ESSOLUBE® HD



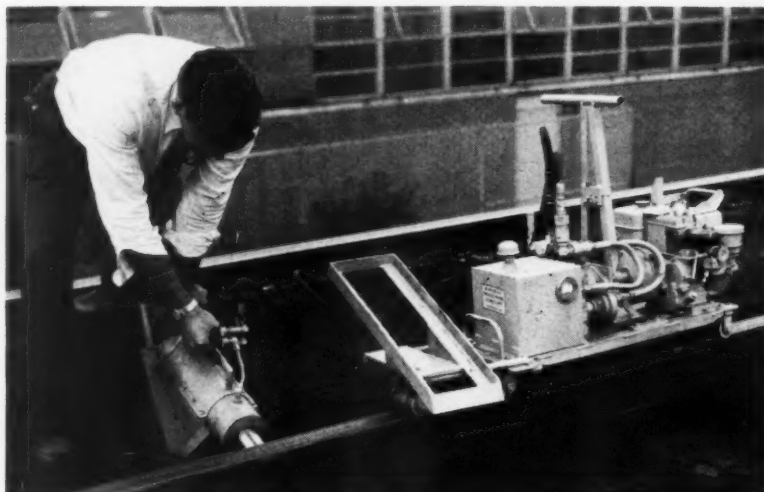
RAILROAD PRODUCTS



"Swinging gun mount" for . . .

Spiker-nipper

THE SPIKEMASTER is now available with a "swinging gun mount." It is claimed this assures that the spike driving guns are positioned accurately over both rails regardless of variations in track gage or curvature. This is accomplished automatically by the use of flanged pilot wheels which are held to the rail head. Much better control of the driving guns is claimed by the use of the new mount in conjunction with an individual air cylinder for each driving gun. *Railway Maintenance Corporation, Dept. RTS, Box 1888, Pittsburgh 30, Pa.*



Portable and compact . . .

One-man spot liner

A NEW portable and compact hydraulic "spot liner" has been made available. The power plant is a 1-cyl, 2-hp gasoline engine mounted on a carriage designed to operate on one rail, with an outrigger for stability. The lining device, a hydraulic ram, is carried on a separate roller that

may be detached from the power-plant carriage. The unit is claimed to be ideal for two-man section gangs, with one man operating the cylinder and the foreman sighting the track. The power unit and cylinder each weigh 100 lb. It is said that the cylinder delivers a maximum thrust of 22,000 lb at 1800 psi. *Railway Track-work Company, Dept. RTS, 3207 Kensington Ave., Philadelphia, Pa.*



Low-cost coatings with . . .

B & B spraying machine

PROTECTIVE COATINGS now can be applied to bridge decks and under structures by a machine applicator called the Patton B&B sprayer. It is also said to be suitable for applying grease-type coatings to bridge steel.

The unit is a self-propelled, hydraulically operated machine, with speeds up to 20 mph on the rails. It has flanged wheels which are retractable so that the weight of the machine can be carried by rubber-tired wheels while being towed by a small truck over the highways. The B&B sprayer has a carrying capacity of six 55-gal drums of protective coating and



LEFT—No operator is required to control movement of the machine when spraying bridge decks. ABOVE—A gravel distributor is available as a companion unit.

it has a thermostat-controlled heating system for warming the material on cold days. Only 40 min is said to be required to spray the entire 330 gal on a bridge deck.

It is claimed that no operator is required to control the machine movement while spraying bridge decks. Remote control on one of the three pole guns is standard equipment. The sprayer can also be used to operate and supply eight regular paint guns. The manufacturer states that, when using this machine, a protective coating that will serve for 8 to 10 years can be applied on a single-track bridge deck for less than \$1.00 per lin ft, including labor



Why are there two elements in the BULLDOG anchor?

Listen to this conversation between a track maintenance man and a True Temper engineer.

A. No other construction permits such a tremendous amount of holding power. The two elements actually multiply and sustain the gripping power of each other.

Q. Wouldn't a single clamp, or a single spring, do as well?

A. No. Most rail anchors are simple one-piece torsion springs. They grip the rail base with horizontal force. Only the BULLDOG uses both horizontal and vertical force—a combination that increases holding power 25%.

Q. Well, how do these two elements do that?

A. One element is a spring, tempered for resilience. It

functions like ordinary anchors by gripping the rail horizontally. The second element—and here is where the BULLDOG is unique—is a double-jawed clamp of hardened steel. This is fitted to the spring to add vertical force by gripping the rail at the base.

Q. And this actually increases holding power?

A. Absolutely. Precision tests prove it. The BULLDOG's two-way grip, using both horizontal and vertical force, gives you much more holding power. And, after all, holding power is what you're buying in a rail anchor.

Q. Okay. But isn't this anchor harder to apply?

A. Not at all. It's *assembled at the factory* into one unit that's very easy to ship, handle and apply. It has all the convenience of a one-piece anchor. Track workmen like it because one man can install it easily with any striking tool—sledge or spike maul. And to make application even more economical, True Temper now offers two machines—one hydraulic, the other mechanical—that do the job almost automatically.

Q. Do other railroad men agree with you?

A. They certainly do. Over half the railroads buy the BULLDOG, and the number is increasing. It's the fastest-growing rail anchor in the business.

Want to hear more? Just contact your True Temper representative, or write True Temper, Railway Appliances Division, 1623 Euclid Avenue, Cleveland 15, Ohio.

OTHER TRUE TEMPER RAILWAY PRODUCTS: Track Shovels • Ballast Forks • Weed Cutters • Hammers • Sledges • Scythes • Safety Rail Forks

TRUE TEMPER.



**BULLDOG
RAIL ANCHORS**

YOU CAN LOOK TO  FOR LEADERSHIP

Products (cont'd)

and material. A gravel distributor also is available as a companion unit and is adjustable for applying gravel up to a 12-ft width. *The Roy C. Patton Company, Dept. RTS, P. O. Box 171, Jacksonville Beach, Fla.*



Lift up to 3 tons with . . .

Truck-mounted crane

FROGS, switches, small track machines, wheels and axles may be lifted, loaded, carried and unloaded by means of a new hydraulic crane mounted on a truck. Designated HIAB Model 170, the crane has a capacity of three tons and may be mounted on any old or new truck having at least 15 in of space behind the cab. It derives its power from a power take-off unit on the truck and is operated hydraulically by one man. A safety feature includes a ball check valve which makes dropping a load impossible, and a by-pass valve which prevents overloading. *Stedt Hydraulic Crane Company, Dept. RTS, P. O. Box 188, Ashland, Mass.*

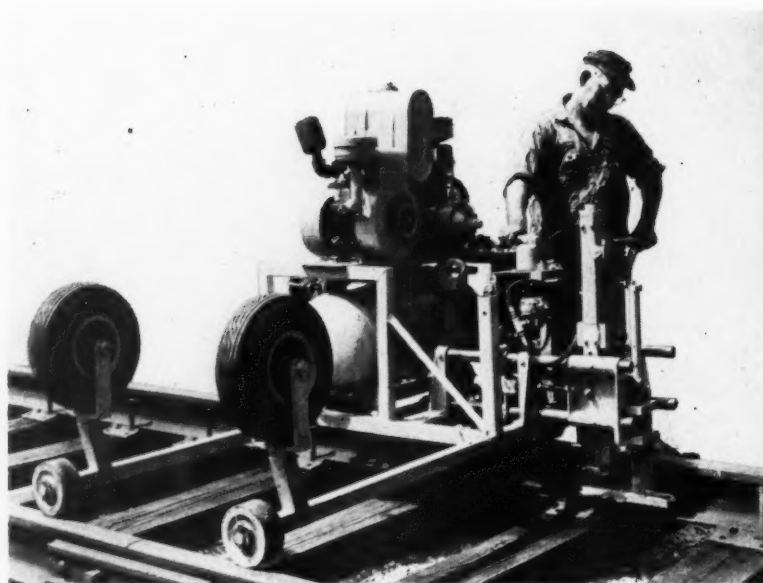
Attachments available for . . .

These utility tractors

TWO Allis-Chalmers utility tractors, Models D-14 and D-17, are now available with a complete line of attachments and companion equipment. These tractors and the equipment for them will be sold through dealers in the company's Farm Equipment, Construction Machinery and Engine-Material Handling Divisions on a non-exclusive basis.

The D-14 tractor has 35.65 hp, weighs approximately 4,200 lb, without equipment, and has an overall tractor length of 140 in. The D-17 tractor has 54.43 hp, weighs approximately 5,300 lb, without equipment.

Both tractors feature low-line, high-clearance design that provides a low center of gravity for stability and extra high axle clearance. Power-shift rear wheels and Roll-Shift front axle permit changing



No hand work with . . .

Spike setter

ELIMINATION of hand work in setting spikes ahead of any type of spike driver is claimed for a new mechanical spike setter. It is a self-contained, compact, pneumatic machine operated by one man. Power is supplied by a gasoline-engine-driven air compressor mounted integrally on the carriage. Track spikes are first placed in the tie-plate holes so that they lean inward toward the rail. Retractable guides then straighten the spikes but lean them forward in the direction of the mo-

tion of the machine. Finally, when the control lever is depressed brakes are applied to the machine, the spikes are brought back to vertical, and then struck a hard blow which sets them firmly. It is claimed that this complete sequence of stopping the machine, straightening and setting two spikes simultaneously, is accomplished in less than two seconds. Very consistent results are reported while practically no skill is required to operate the machine proficiently. *American Brake Shoe Company, Railroad Products Division, Dept. RTS, 155 N. Wacker Drive, Chicago 6, Ill.*

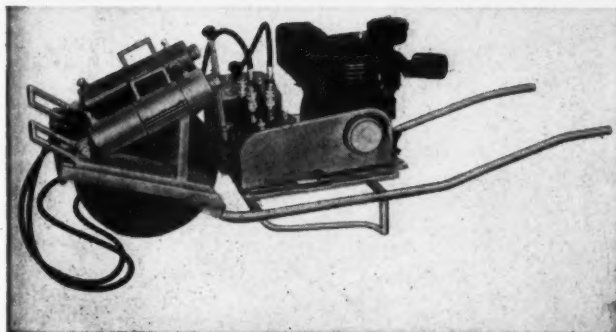
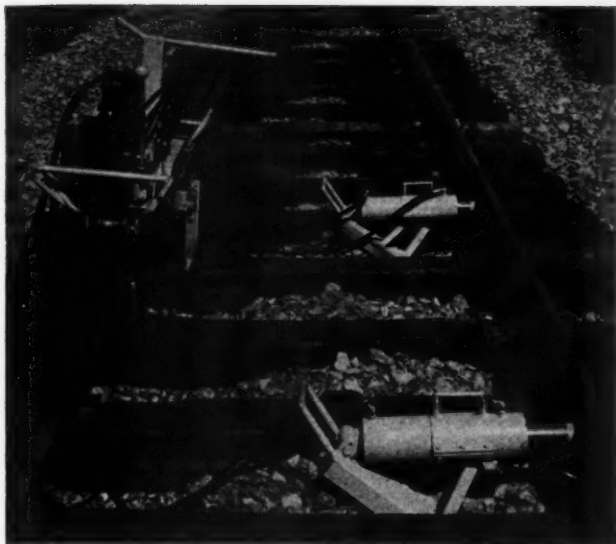


wheel widths quickly and safely without the use of jacks or blocks.

A power control, called the "Power Director," which is an extra for the D-14 and the D-17, permits on-the-go shifting to high or low range, and provides eight forward and two reverse speeds. Also available as optional extras are a constant-speed live power take-off, and a continuous operating hydraulic pump which assures hydraulic power at all times to con-

trol a variety of tools. The manufacturer's equipment includes disc harrows, coil shank and field cultivators, blades, scoops, tool bars, post-hole diggers, subsoilers, and carriers. Other manufacturers' equipment includes backhoes and loaders, rotary tillers, cutterbar highway mowers and rotary mowers. *Allis-Chalmers Manufacturing Company, Tractor Group, Dept. RTS, Milwaukee, Wis.*

(More on page 60)



RTW HYDRAULIC TRACK LINER

**More track lined per hour with
Minimum effort and expense**

The RTW Hydraulic Track Liner—Model P-O—was devised and designed by railroad engineers thoroughly familiar with maintenance of way problems.

A light rigid self contained attachment with double flanged rollers used with the P-O Track Liner adjusts to any height or weight of rail. It supports a portable air-cooled 8 horsepower gasoline driven engine. This power plant can be used with two hydraulic rams for lining thru switches, road crossings, etc., as well as supplying power for the attachment for out-of-face lining. Its light weight and portability reduces operator fatigue.

Railway Trackwork Co.

3207 KENSINGTON AVE., PHILADELPHIA 34, PA.

RAILWAY TRACK and STRUCTURES

Upper left—Model P-O gasoline engine powered Hydraulic Track Liner operating two hydraulic rams.

Upper right—Model P-O gasoline engine powered Hydraulic Track Liner operating attachment with double flanged track rollers, adjustable for any height and weight of rail.

Lower left—Model P-O gasoline engine powered Hydraulic Track Liner and two hydraulic rams mounted on wheelbarrow type frame that can easily be operated or transported by one man.

Lower right—Model H-O Hydraulic pump, light weight, hand operated, that will supply power for one (as shown) or two rams. Ideal for small gangs.

This equipment is also available mounted on a wheelbarrow type frame that can be transported by one man for use in heavy traffic areas.

The hand operated hydraulic pump, available with either one or two hydraulic rams, is ideal for spot lining with small gangs.

The interchangeable units of these highly portable power operated Hydraulic Track Liner combinations afford a smaller force, the equipment necessary to do the work that normally would require heavier oversized machines and a large crew.

Write for complete details today

TRACK MAINTENANCE MACHINERY

Switch Grinders • Cross Grinders • Surface Grinders • Rail Drills • Ballast Extruders • Tie Nippers • Grinding Wheels • Track Liners

SEPTEMBER, 1958

57

REVIVE RUNDOWN

... and do



New P-S POWER BALLASTER—4 ways better

1—Out-In-Front Split Crosshead

The new Pullman-Standard Power Ballaster features an out-in-front split crosshead—gives this machine exceptional versatility. The two, free-falling crossheads operate independently or together—allows this new machine to handle both out-of-face surfacing or spot tamping jobs with equal ease.



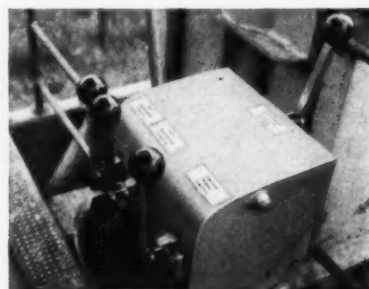
2—High-Quality, High-Speed Tamping

The new P-S Power Ballaster uses a fork-like tamping tip to assure proper tamping action. Ballast penetration is faster and more thorough, undertie compaction is uniform and stable.



3—Tamps Any Raise, Any Ballast

The new P-S Power Ballaster offers both adjustable tamping stroke and selective tamping depth. Operators can use the most efficient tamping force at the best "below-tie" location to meet any raise or ballast condition.



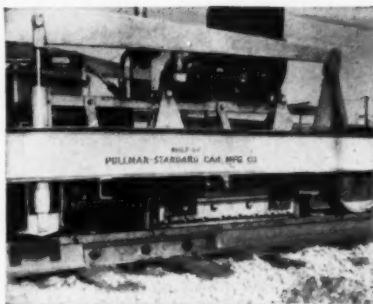
4—Simplified Design, Easy Operation

The use of hydraulic operation throughout simplifies the Ballaster design. The need for maintenance is minimized... users get longer, trouble-free service. Improved operator visibility and new, easy-to-use hydraulic controls permit faster spotting, reduce operator fatigue.

RIGHT-OF-WAY

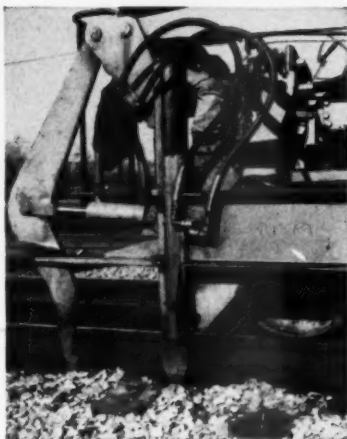
it faster at less cost

New P-S POWER TIE SPACER—3 way economy



1—Quick-Acting Magnetic Hold-Down Assures Fast Spacing

Pullman-Standard uses a powerful, quick-acting magnetic hold-down device to shift and position ties. Gives a shifting range of 20 inches.



2—Tie Tongs Work Independently—Meet Any Condition

With the new P-S Tie Spacer, tie tongs operate independently . . . can handle any skewed tie condition, pick up down ties and nip and hold ties for spiking. And since the tie is positioned against the machine frame, it is automatically squared.

3—One Operator Handles All Tie-Spacing Jobs

The new P-S Power Tie-Spacer quickly and economically performs all tie-spacing operations—changing the number of ties per rail, straightening and positioning ties in heavy tie-renewal programs and squaring ties ahead of surfacing operations.



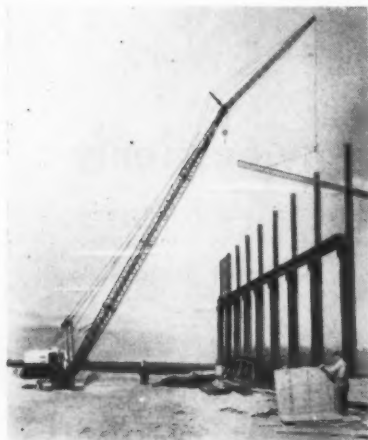
For Complete Information on the advantages of the new P-S Tie Spacer or the new P-S Power Ballaster write to the Track Equipment Department, Pullman-Standard Car Manufacturing Company, 1414 Field Street, Hammond, Indiana or The Holden Company Montreal, Que., Canada

PULLMAN-STANDARD

CAR MANUFACTURING COMPANY
SUBSIDIARY OF PULLMAN INCORPORATED
200 South Michigan Avenue, Chicago 4, Illinois
BIRMINGHAM • PITTSBURGH • NEW YORK

Products (cont'd)

(Continued from page 56)



Heavy-duty lifting with . . .

New crawler crane

GREATER lifting capacity than the standard 30-B crawler is claimed for the new crawler-mounted 30-B heavy-duty crane. Its maximum load at a 10-ft radius with a 40-ft boom is said to be 35 tons. Standard equipment includes: 30-in wide crawler treads; 40-ft two-section welded boom construction of Tri-Ten steel; three boom-point sheaves; a spring cushioned, telescoping-type boom stop; and equipment for power-controlled lowering of the load on the main hook. Main operating functions are air controlled. Boom inserts are available up to 30 ft in length. An open-throat upper section permits rigging of the hoist rope up to six parts of line. It is claimed that at high boom angles the hoist line can pass behind the sheaves without fouling the boom. *Bucyrus-Erie Company, Dept. RTS, South Milwaukee, Wis.*



For small-gang use . . .

"Monorail" tamper

DESIGNED to increase tamping production of small section gangs is a new one-man operated multiple-tool machine designed to tamp one end of the tie. Known as the Jackson Monorail Tamper it is a light power tamper employing the same vibratory tamping motors that are used in manually guided four-tamper outfits. Forward and reverse movement and the raising and lowering of the workhead are accomplished by the single operator and are hydraulically actuated.

Electric power to the tampers is supplied by a gas-electric power plant with sufficient extra horse-power in the air-cooled gasoline engine to take care of the hydraulic operations. The power plant has its own integral-platform base which can be easily removed from the tamper carriage for use in other work.

The Monorail Tamper is said to be

ideal for normal yard work and for spotting and smoothing operations on lines ballasted with gravel or finer ballast. Where the lift of track is equal to or greater than the maximum size of ballast used it is claimed the machine can operate in any kind of material.

A powered jack is incorporated in the main frame member for setting off and turning the machine. A portable light steel set-off is provided. Removal from one rail to the other or from one adjacent track to another is readily accomplished.

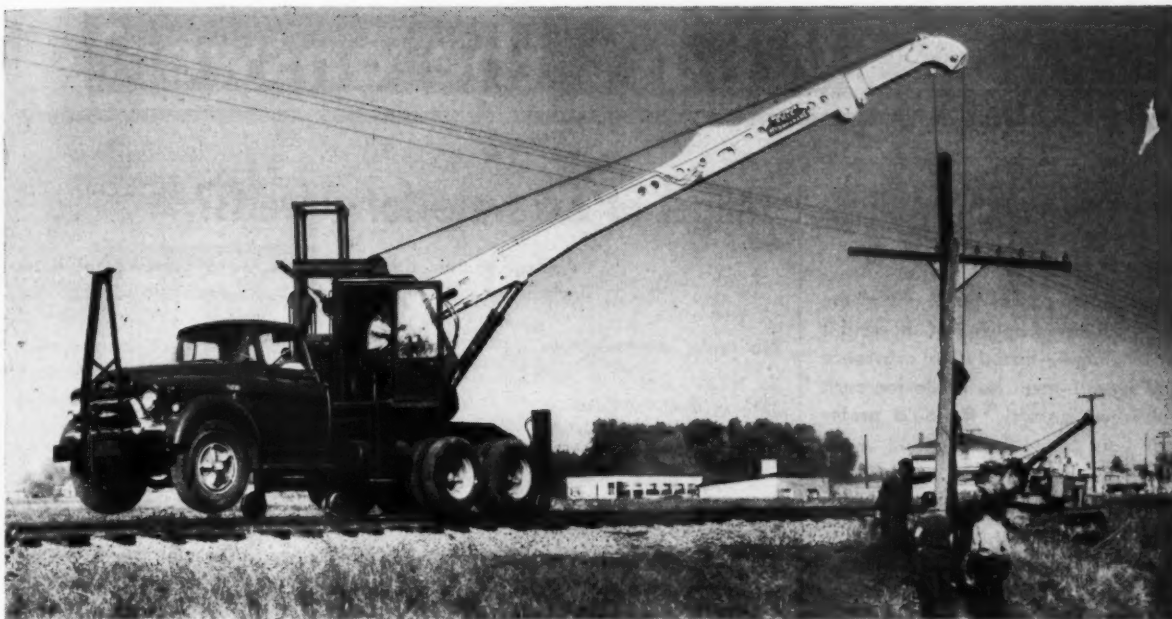
In process of development is a method of dual operation to permit one man to control two machines hooked up mechanically. Both machines would then tamp the same tie, one on each end. It is pointed out that this would be suitable for use in small out-of-face raising operations. A removable jack for power raising is also being developed as an optional feature. *Jackson Vibrators, Inc., Dept. RTS, Ludington, Mich.*

One-man operated . . .

Spike driver, tie nipper

A CARRIAGE equipped for use with a pneumatic spike driver and having a built-in tie nipper has been introduced. It is said that this unit allows railroads to have a mechanized spike driver at nominal cost since the air compressor and air gun are furnished by the railroads from their existing stock. Known as Model 60 the carriage is self-propelled in either direction by an air motor. The gun supported in a swivel-mounted, telescoping boom which, it is claimed, allows fast and precise positioning over the spike. It is also pointed out that this feature allows the operator to follow the spike if it begins to go crooked. It is stated that with this machine one operator can nip the tie and drive all the spikes on either side of both rails. *Kalamazoo Manufacturing Company, Dept. RTS, 1827 Reed St., Kalamazoo, Mich.*





This H-5 Hydorrailer uses its precision control and telescoping boom to spot a pole along a spur line in Indiana.

A Section Gang in Itself New Hydorrailer rides the rails or rides the roads

Bucyrus-Erie's new *all-hydraulic* H-5 Hydorrailer gets on and off rails in seconds — out of the way of a train in a hurry. To get on rails, the operator simply lines up the Hydorrailer with the track and lowers the power-set outriggers. Then, he lowers the rail wheels and raises outriggers — both under hydraulic power — and is on his way down the rails. Reverse the procedure and the Hydorrailer is highway-borne again.

OTHER HYDORRAILER FEATURES

Here are more features that let this quick-switch artist handle all kinds of jobs around depots, docks, material dumps, along spur lines and main lines.

ONE-MAN CREW — On or off rails, all truck and crane operations can be controlled optionally by the operator from his station in the crane cab.

3-DIMENSION BOOM — Telescoping boom reaches in and out, over and under, swings left and right.

FAST JOB-TO-JOB TRAVEL — On rails, equal speeds in both directions is limited by safety considerations. Off rails, H-5 Hydorrailer travels up to 50 mph over open roads.

QUICK-SET WORK BASE — Four hydraulic outriggers, power-set in seconds, form a stable, level work platform—even on slopes or uneven terrain.

YEAR-ROUND WORK-HORSE — Fast, simple front end conversion and wide variety of attachments let you work this machine the year around.

Your Bucyrus-Erie distributor wants to show you *all* the money-making advantages of this quick-change artist on high iron — the 12-ton Bucyrus-Erie Hydorrailer.

**OVER 50% OF HYDROCRANES SOLD
LAST YEAR WERE REPEAT SALES**

WHAT MAKES A HYDORRAILER ROLLING STOCK

Two sets of rail wheels, mounted on roller bearings, are fastened to a truck axle. The inside rear tires of the truck ride track to provide motive and stopping power.

284H58C



BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

What's the answer?

To be answered in December

Do you have an answer to any of the questions listed below? If so, send it in. Payment—based upon substance and length—will be made for each published answer. If you'd prefer that your name be withheld, we'll gladly comply.

DEADLINE: October 31

- ▶ 1. When the B & B supervisor goes on his regular inspection trip is there enough advantage to justify having the track supervisor take time from his own work to accompany him? Explain.
- ▶ 2. What is the best method of preventing or retarding deterioration of floorbeams and other under-track members of through girders and trusses exposed to brine drippings? Describe.
- ▶ 3. What factors are used to determine when it is no longer economically feasible to weld manganese frogs? Explain.
- ▶ 4. How can the efflorescence on brick walls be prevented? What remedial measures are practicable? Describe.
- ▶ 5. How often should track gages and level boards be tested for accuracy? How should this be done?

Send answers to:

What's the Answer Editor
Railway Track & Structures
79 West Monroe Street
Chicago 3, Illinois

Do you have a question you'd like to have answered in these columns? If so, please send it in.

Tunnel or excavate for culverts?

What factors determine whether a culvert should be installed by tunneling or by open excavation? Explain.

No train interruption

By W. P. LIPSCOMB
Manager Railroad Sales
Armco Drainage & Metal Products, Inc.
Houston, Tex.

I have found that many factors influence the proper method to use. Of primary concern is the installation of the required structure without interruption to the movement of trains. Tunneling with experienced personnel accomplishes this purpose economically. It also assures track-level business as usual, eliminates distasteful traffic detours or expensive track supports over open excavations with resultant soft spots requiring periodic maintenance.

Determination of the most suitable method would also involve the importance of the track (whether main or secondary line), traffic density, train speeds, safety for workmen, depth of the structure, as well as type of soil and water content.

Tunneling may be safely accomplished throughout the year, regardless of the season or weather conditions. Open excavation, on the other hand, is dependent on good weather.

The foregoing is merely an abbreviated statement of items of primary consideration in answering your question briefly to meet space requirements of your fine publication. Obviously a detailed comparison of methods should include other tunneling methods, such as boring and jacking, as well as types of materials available for all methods.

Urgency a factor

By H. M. TREMAINE
District Engineer (Ret.)
Northern Pacific.
Spokane, Wash.

It is hardly practicable to list all the factors which must be taken into account in the study which should be made. But they may be dealt with in an analytical discussion.

One must first take into account the urgency. If conditions are such as to require the quickest possible work, then costs must be ignored. This reasoning applies whether it be an entirely new opening or the replacement of an existing one.

If the time factor is not a determinant for a new opening, then costs are the controlling issue. These costs must include the resultant track-maintenance cost with the original cost. Also, if the work, as planned, would require a train slow order, that feature must be given careful appraisal in which density and speed of traffic must be weighed.

The size of the opening, at times, may be a dominant feature. Also, a culvert less than 48 in. in diameter may not be successfully installed by tunneling without incurring undue costs. The writer has employed a tunnel method for 42-in culverts but does not feel that this practice is to be ordinarily recommended.

If the culvert is to be installed in a fill or cut, its height or depth, as well as the classification of the material, must be given careful thought.

If the culvert installation is one of replacement or enlargement, the tunnel method usually is less expensive and practically always more satisfactory. It may be handled without train slow orders and, if properly done, should not result in track settlement or any deterioration of the roadbed.

If running water must be carried through the opening, entirely new, or shall we say foreign, factors are encountered which may only be solved from an on-the-ground study. In that event, if the water may not be diverted, a slight shift in culvert location might be helpful.

It is assumed, also, that grillage for the opening is not a factor for this type of discussion. That would require a "study on the ground" for

(Continued on page 67)



contributes to railroad progress

Guided by a sincere desire to meet and anticipate the ever-changing demands of progress, CF&I has, through the years, closely cooperated with the western railroads in the development of new and improved rails and track accessories.

Recently, CF&I has introduced three new rail sections, the 106, 119 and 136 lb. These new improved sections were developed with present-day needs and conditions in mind...
track betterment... safety... economy.

These designs embody a combination of effective engineering features approved and accepted by prominent railroad engineers. Performance has proven the superior characteristics of these designs, justifying the recognition afforded them.

Past achievements of CF&I and the railroad industry have been a constant inspiration toward greater accomplishments, continuous development and dependable service.

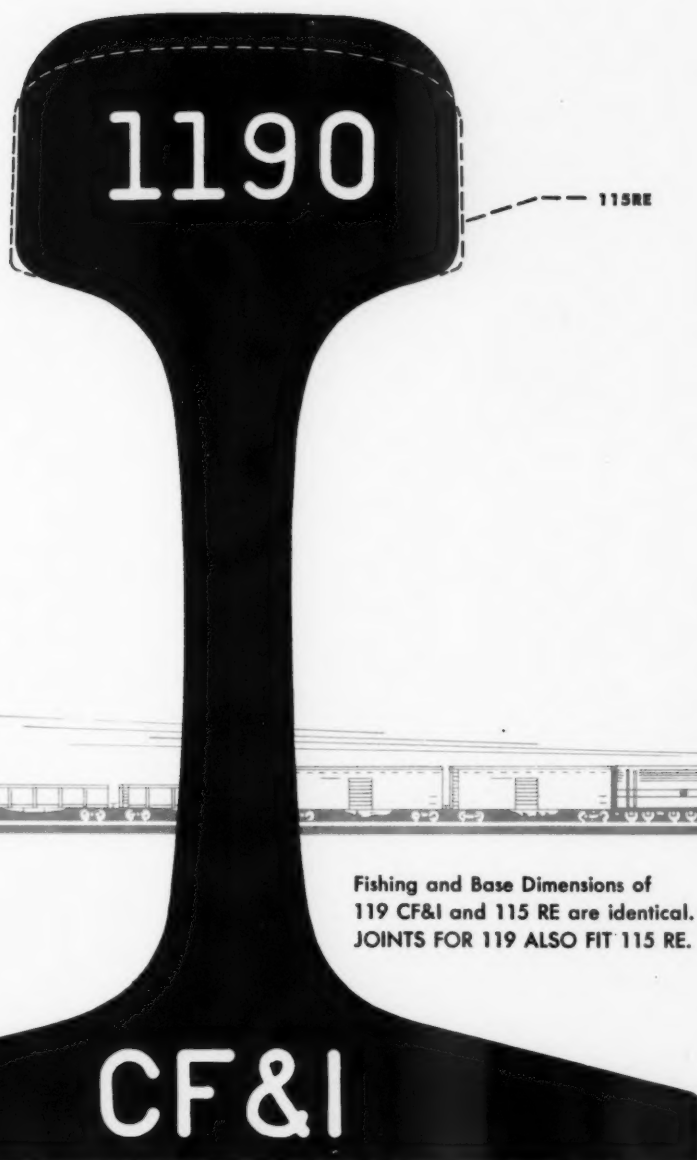


PROPERTIES OF SECTIONS

ITEM	SECTIONS		COMPARISON OF 100 RE TO CF&I 1060	
	100 RE	CF&I 1060		
AREA: HEAD	3.80 Sq. In.	4.00 Sq. In.	+ 5.3%	
WEB	2.25 Sq. In.	2.50 Sq. In.	+ 11.1%	
BASE	3.90 Sq. In.	3.95 Sq. In.	+ 1.3%	
TOTAL	9.95 Sq. In.	10.45 Sq. In.	+ 5.0%	
Weight per yard	101.5 lbs.	106.6 lbs.	+ 5.0%	
G.T./mile — single track	159.50	167.5	+ 5.0%	
N.T./mile — single track	178.64	187.6	+ 5.0%	
Moment of Inertia (I)	49.00	53.6	+ 4.6 ^{1/4}	+ 9.4%
Section Modulus, Head	15.1	16.1	+ 1.0 ^{1/3}	+ 6.6%
Section Modulus, Base	17.8	18.8	+ 1.0 ^{1/3}	+ 5.6%
Ratio, "I" to Area	4.9	5.1	+ 0.2	+ 4.1%
Ratio, Section Modulus to Head Area	1.5	1.5	SAME	
Distance, Base to N.A.	2.75"	2.85"	+ 0.10"	

Comparative maximum web stresses in the CF&I and A.R.E.A. rail sections, calculated in accordance with the method recounted in the A.R.E.A. Proceedings, Vol. 48, pages 987-991.

	psi	
106 CF&I	18,700	
100 RE	27,300	46%



Fishing and Base Dimensions of
119 CF&I and 115 RE are identical.
JOINTS FOR 119 ALSO FIT 115 RE.

PROPERTIES OF SECTIONS

ITEM	SECTIONS		COMPARISON OF 115 RE TO CF&I 1190.	
	115 RE	CF&I 1190		
AREA: HEAD	3.91 Sq. In.	4.32 Sq. In.	+ 10.5%	
WEB	3.05 Sq. In.	3.04 Sq. In.	- 0.3%	
BASE	4.29 Sq. In.	4.29 Sq. In.	SAME	
TOTAL	11.25 Sq. In.	11.65 Sq. In.	+ 3.6%	
Weight per yard	114.7 lbs.	118.8 lbs.	+ 3.6%	
G.T./mile — single track	180.7	187.0	+ 3.5%	
N.T./mile — single track	202.4	209.4	+ 3.5%	
Moment of Inertia (I)	65.6	71.4	+ 5.8 ^{1/4}	+ 8.8%
Section Modulus, Head	18.0	19.4	+ 1.4 ^{1/3}	+ 7.8%
Section Modulus, Base	22.0	22.9	+ 0.9 ^{1/3}	+ 4.1%
Ratio, "I" to Area	5.83	6.13	+ 0.3	+ 5.1%
Ratio, Section Modulus to Head Area	1.6	1.7	+ 0.1	+ 6.3%
Distance, Base to N.A.	2.98"	3.124"	+ 0.144"	

Comparative maximum web stresses in the CF&I and A.R.E.A. rail sections, calculated in accordance with the method recounted in the A.R.E.A. Proceedings, Vol. 48, pages 987-991.

	psi	
119 CF&I	13,400	
115 RE	15,200	13%



1360

132 RE

PROPERTIES OF SECTIONS

ITEM	SECTIONS		COMPARISON OF 132 RE TO CF&I 1360	
	132 RE	CF&I 1360		
AREA: HEAD	4.42 Sq. In.	4.86 Sq. In.	+ 10.0%	
WEB	3.66 Sq. In.	3.62 Sq. In.	- 1.1%	
BASE	4.87 Sq. In.	4.87 Sq. In.	SAME	
TOTAL	12.95 Sq. In.	13.35 Sq. In.	+ 3.09%	
Weight per yard	132.1 lbs.	136.2 lbs.	+ 3.10%	
G.T./mile — single track	207.4	213.7	+ 3.04%	
N.T./mile — single track	232.3	239.4	+ 3.06%	
Moment of Inertia (I)	88.2	94.9	+ 6.7 ^{1/4}	+ 7.6%
Section Modulus, Head	22.5	23.9	+ 1.4 ^{1/3}	+ 6.2%
Section Modulus, Base	27.5	28.3	+ 0.8 ^{1/3}	+ 2.9%
Ratio, "I" to Area	6.8	7.1	+ 0.3	+ 4.4%
Ratio, Section Modulus to Head Area	1.7	1.8	+ 0.1	+ 5.9%
Distance, Base to N.A.	3.2"	3.347"	+ 0.147"	

Comparative maximum web stresses in the CF&I and A.R.E.A. rail sections, calculated in accordance with the method recounted in the A.R.E.A. Proceedings, Vol. 48, pages 987-991.

	psi	
136 CF&I	10,800	
132 RE	13,300	23%

Fishing and Base Dimensions of
136 CF&I and 132 RE are identical.
JOINTS FOR 136 ALSO FIT 132 RE.

CF&I

COMPARISON OF THREE CF&I SECTIONS RELATIVE
TO A. R. E. A. SECTIONS BASED ON ACTUAL SIZE.

THE COLORADO FUEL AND IRON CORPORATION

Denver, Colorado



What's the answer? (cont'd)

(Continued from page 62)
which general observations are not helpful.

Installation of a culvert by open excavation may or may not require false-work. This depends on a variety of conditions. In shallow fills resort may be made to excavation, contingent on the available time. But, in fills of sufficient height, the tunnel method is almost always preferable, unless the culvert is too small.

Conditions must be weighed

By A. B. WANG
Bridge & Building Supervisor
Monon
Lafayette, Ind.

Coated corrugated-iron pipe, because of its light weight, strength, non-corrosive qualities and use of sections, is the best pipe to use for a new culvert.

Most embankments should have enough stability to withstand tunneling when there is six feet between

the base of rail and the top of the pipe. Any but the very soft clays will provide sufficient arching stability. Open-cut excavation can be used as far as the ends of the ties. For pipe up to 36 in. in diameter, tunneling under the track can be done by hand, then the pipe pushed in. Pipe larger than 36-in can be jacked in and the material removed from the inside as the pipe is pushed forward.

Where sand, gravel, cinders and spalls are in a fill, and where the installation is to be a small pipe at not a very great depth, the ends of the ties can be bridged by stringers and sills to hold the track in place, and an open cut may be made beneath them.

For installing large-size pipe, such as 4 ft in diameter and larger, in poor fill material, the track can be removed and a trench dug by a crane to a reasonable depth.

For large pipe of 8 ft in diameter and up, usually of course at a greater depth, excavating and using a tunnel liner would seem most practical. Temporary trestles also can be built but the problem of compacting the

backfill must be given consideration.

For shallow jobs and poor conditions, auger drilling up to 24 in has been used successfully in special cases for water or sewer-pipe encasement.

Each condition will vary and common sense should be used to keep the track safe, as well as to provide for train movements without the use of slow orders.

Depends partly on size

By R. B. MIDKIFF
Chief Engineer
Maint. of Way & Struct.
Southern
Knoxville, Tenn.

The factors involved in answering this question are:

- (1) Size and type of culvert.
- (2) Depth of cover.
- (3) Character of fill, including stability during tunneling and obstructions, such as large rocks, which may be expected.
- (4) Length of time available between trains.
- (5) Accessibility to site by heavy

FOUND!

the KEY to CUTTING COSTS
in TRACK LINING!

This is it!
WESTERN
JM-1 and JM-2 Line Aids

The true aid to greater economy in track maintenance

Here at Last! Track lining with savings of \$40.00 per hour and requiring a crew of only 6 men to line the same amount of rail as the old fashioned 24-man crews.

LINE-AIDS are precision tools which are the crucial missing links in jack lining as a transmission is to an automobile. The application of the JM-1 and JM-2 enables a track man to utilize the full power of the track jacks for moving the rail with a minimum of lift—far less than that which is usual with regular jacks or bar lining.

Designed to give the track man a tool to help him hold the line with greater accuracy, ease and safety.

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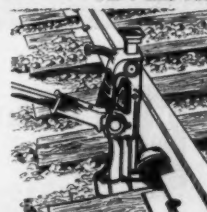


JM-2 Line Aid

FEATURES

- 1 Precision cut grooves to fit all rail.
- 2 Constructed of Westaloy steel for heavy-duty and long life with a safety factor of three.
- 3 Slipproof—will not slip from jack or rail.
- 4 Available in two types to meet all ballast conditions for operation with either large or small track jacks.
- 5 Utilizes the full power of the jack for lateral movement with very little track raising.
- 6 They are light, compact, easy to carry and set under rail. Line-Aids weigh 16 pounds.
- 7 No digging at the end of the ties.

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on how your road
can save money
write WRRS.



JM-1 Line Aid

What's the answer? (cont'd)

excavating equipment, and working space.

(6) Adaptability to jacking in lieu of tunneling or open excavation.

(7) Handling of drainage during construction.

The size of pipe required influences the selection of a method of installation since, if tunneling or jacking is used, a size of 48 in for tunneling or about 36 in for jacking is the smallest that is practicable, even

though a smaller size would otherwise serve.

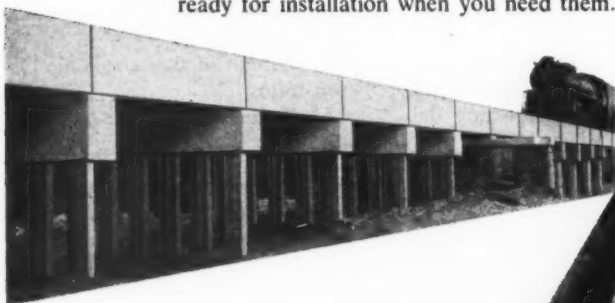
For successful tunneling without falsework being required, there must be sufficient cover over the culvert to prevent collapse of the roadbed under the track.

If there are no obstructions in the fill, jacking the pipe, combined with open excavation near its ends, may be found practicable. If the fill material is very unstable and jacking or open excavation is not feasible, falseworking the track may be the only solution.

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One disadvantage of tunneling is that tunnel liners usually have projections on the inside which catch drift, although paving the bottom arc will help somewhat, or a slightly smaller conventional pipe may be threaded through the tunnel liner.

Development of machinery for open excavation has been progressed far beyond the development of machinery for either jacking or tunneling culverts, and wherever the amount of material to be handled, the length of time available between trains, and the site conditions will permit, open excavation will probably be the most economical method. Disturbing the roadbed and fill by open excavation, however, has the disadvantage of requiring slow orders during and after construction, and also requiring a number of resurfacings before the fill becomes stabilized.

Jacking usually safest

By W. J. HUNTSMAN
Supervisor of Structures
Denver & Rio Grande Western
Grand Junction, Colo.

These factors determine whether a culvert should be installed by tunneling or by open excavation.

(1) The safe and normal movement of traffic while installation is being made.

(2) Type of soil where culvert is to be installed.

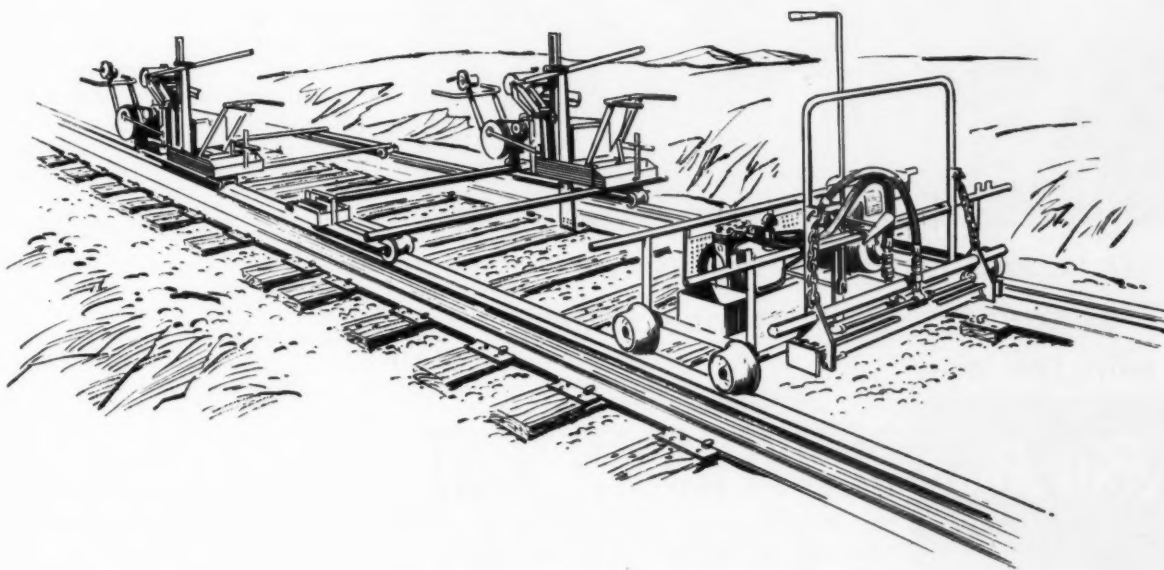
(3) The best installation for the least cost.

Open excavation usually has to be carried out between train movements or has to be bridged to carry traffic while installation is being made. The size and depth of the culvert determines the kind of bridging to use. We do not drive piling unless it is absolutely necessary; the cost is usually prohibitive. We protect some of our excavations with rail or timber "reachovers" that can be handled with men.

Where the soil will hold itself, and the method is otherwise feasible, we tunnel and jack corrugated metal pipe through the grade. This is usually the safest and the cheapest way. The track is always safe for traffic and you have a minimum of soft rails after installation, whereas in open excavation the soil will settle for two or three days. After installation by

Are you looking for an economical method of **CHANGING OLD TIES WITHOUT DISTURBING THE TRACK?**

INVESTIGATE THE WOOLERY TIE CUTTER AND TIE END REMOVER



Even ties which are badly rail cut can be removed without raising the track, trenching ballast or adzing tops of ties.

The Woolery Tie Cutter saws the old tie off inside each rail adjacent to the tie plates. The operator of the Tie End Remover then removes the center section of the tie and lowers a hydraulic cylinder in its place. A turn of the valve puts the hydraulic power into action and both tie ends are pushed out from under the rail whether working

with single or double shoulder tie plates. Sufficient ballast is then removed to allow insertion of the new tie.

For highest efficiency two saws should be used ahead of one Tie End Remover.

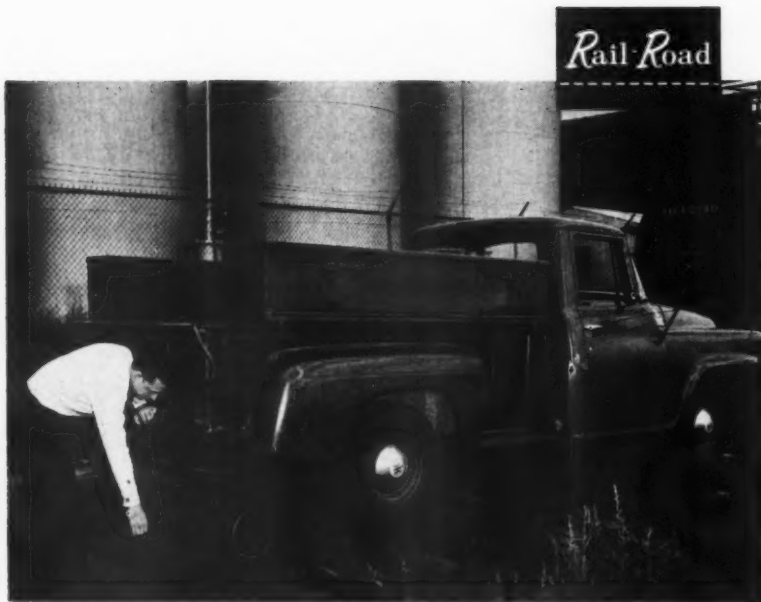
The Woolery machines are light enough so that the operators, by assisting each other, can lift them off the track quickly to clear trains.

Many Railroad men who have used them say, "The best way to change out old ties with least disturbance to the track is to use the WOOLERY Tie Cutter and Tie End Remover."

Write for Bulletins No. 181 and 185.

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HYKIL

vegetation control
and
railway work equipment

What's the answer? (cont'd)

tunneling you have to pressure fill the void that is left around pipe to hold it in the fill.

If the soil is loose and has a tendency to run, we use tunnel liner plates. This method is slower and the cost is greater but you will not interfere with the normal movement of traffic, and you can install this in practically any type soil. We installed a 120-in tunnel liner through decomposed granite that ran like dry sand at a depth of 25 ft without stopping a train or using a slow order.

Where we find soil with elements that deteriorate a corrugated metal pipe rapidly we use treated wood culverts. These usually must be installed by open excavation.

Cites reasons for jacking

By C. E. PHELPS
Bridge & Building Supervisor
Georgia RR
Decatur, Ga.

In most cases we have been jacking and tunneling our culverts for the past 20 years. We also jack and tunnel casings for water lines.

Here are several reasons why I think that a culvert should be tunneled in place instead of installed by open excavation.

(1) Tunneling does not interfere with operation of trains.

(2) Tunneling does not require surfacing of track because of settlement, which you would have with open excavation.

(3) Tunneling does not require material for cribbing, which would be necessary with open excavation.

(4) Tunneling does not require slow orders after installation of the culvert, as would be necessary for several days following open excavation.

(5) Tunneling can be done with fewer man-hours and much quicker than by open excavation.

We have been very successful in tunneling culverts. In sandy soil we have had pipe stop moving when part way through the fill, making it necessary to start from the opposite side of the fill with the objective of joining the two pipes at some intermediate point.

No matter what others may claim for their equipment, THIS FACT REMAINS . . .

. . . rather conclusive evidence, we believe, that in the opinion of the vast majority of leading track chiefs there is nothing that equals the Jackson Track Maintainer for the dual purpose of production tamping and maintaining track of finest quality under all conditions. The more carefully you compare the more convinced you will be that Jackson is your best buy!

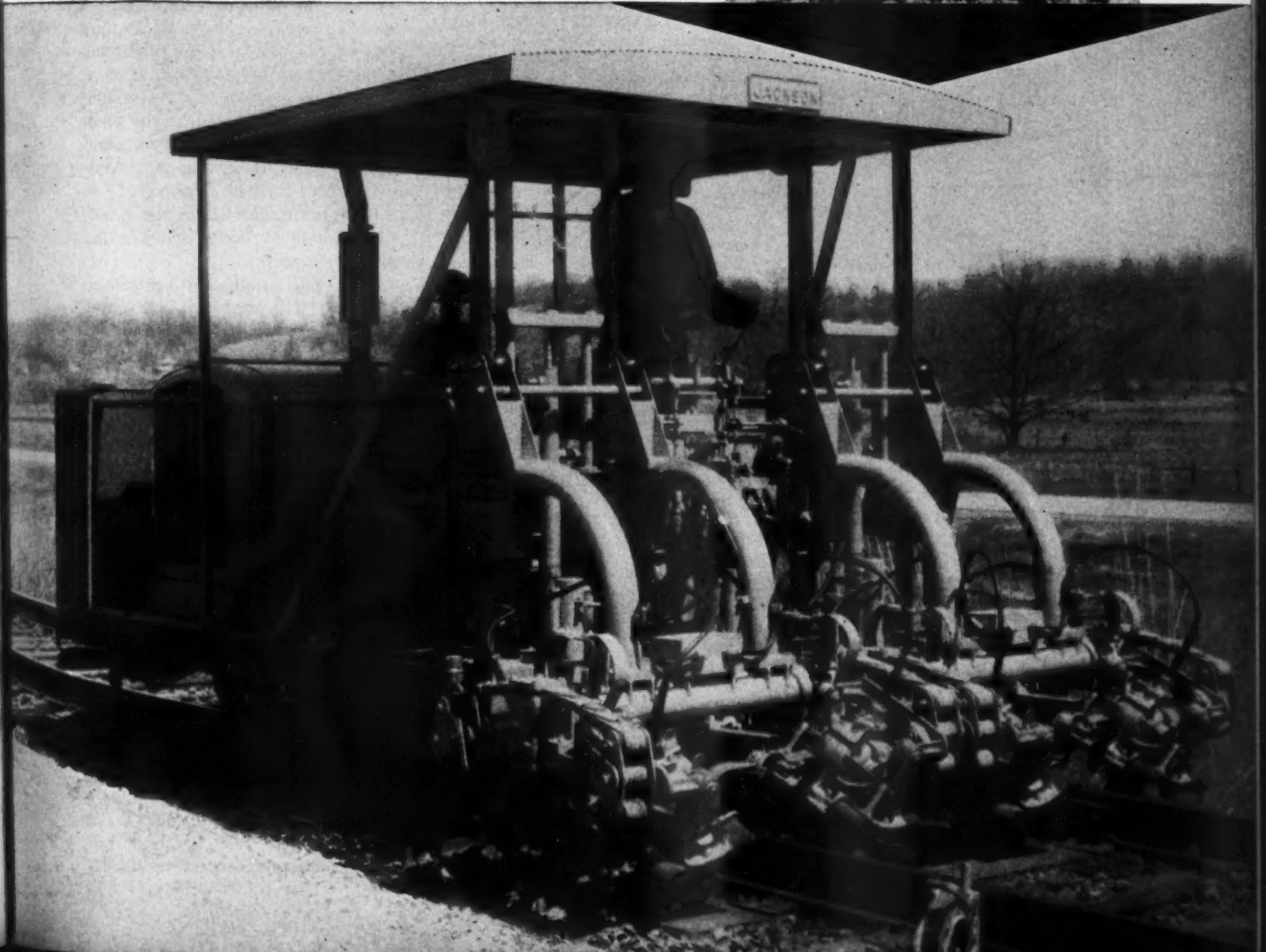
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NEW RAIL-WHEEL MOUNTING GIVES BANTAM TOP VERSATILITY ON-TRACK AND OFF!



Simple, trouble-free rail-wheel mounting on the BANTAM permits you to drive on or off tracks at any rail crossing with ease. Simple retract dolly device front and rear allows the operator to raise or lower rail wheels in minutes. Offers accurate tracking in either direction, maximum stability. One low-cost BANTAM gives you the service of many less versatile machines!

The fast-moving BANTAM now works almost everywhere! New factory-equipped rubber-tire and dolly rail-wheel combination gives you fast highway and on-track travel virtually anywhere—to handle any job that comes up with the greatest speed and efficiency! BANTAM's new rail-wheel mounting is available on either the BANTAM CR-35 one-man-operated, self-propelled crane or the popular carrier mounted T-35 BANTAM shown above on bridge maintenance work, and in yard work at the left. Easy mobility . . . permit-free size . . . precise mechanical controls . . . and 11 fast-change attachments which equip you for all lifting, loading, handling, excavating, pile-driving, erecting jobs—make BANTAM the ideal all-around railway worker and money-saver.



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World's largest producer of
truck crane-excavators

RT-197

What's the answer? (cont'd)

Cutoffs for concrete piles

What is the best procedure for making cutoffs on precast reinforced concrete piles? What equipment will expedite this work?

Pneumatic riveting hammer

By F. H. MCGUIGAN
Bridge Construction Engineer
Missouri Pacific
St. Louis, Mo.

Current practice for cutting off reinforced-concrete piles in connection with concrete trestle work on the Missouri Pacific has been to utilize a pneumatic riveting hammer equipped with amoil point. Normally 6 in of the concrete pile extends above the floor line of the cast-in-place concrete cap and 18 in of the reinforcing rods of the pile are left projecting above the top into the cap. Thus, it is necessary not only to cut off the pile at a predetermined height when adequate bearing has been obtained by either driving, jetting or a combined effort, but also to expose 18 in of reinforcing steel in the pile to develop adequate bond between the pile and the cap.

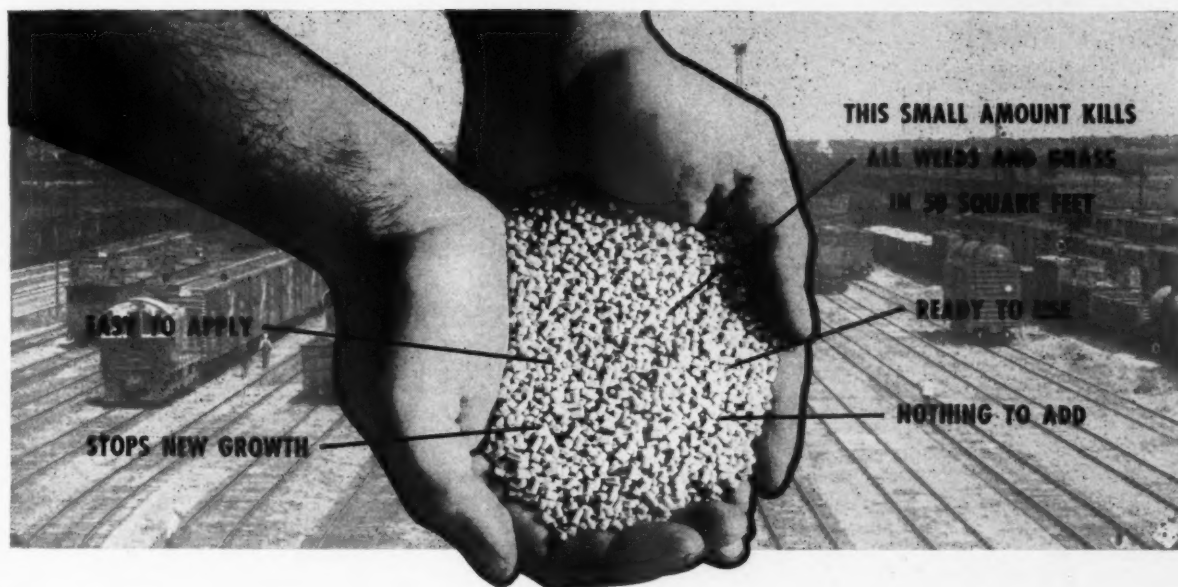
Initial pile lengths for a proposed concrete trestle are based on existing information, such as original wood-pile penetration, or that for falsework installed in connection with the project. A test pile is driven as soon as possible after the arrival of a gang at the new job site. Piles are then furnished as indicated by the test pile and also subsequent variations in penetration. Thus excessive cutoffs or field splices are avoided. Piles are stocked in lengths of from 20 to 55 ft. Between these limits they vary in 5-ft increments. Where ground collars are provided, precast concrete posts are utilized to advantage.

A portable air compressor furnishes air for the pneumatic hammer. The latter normally is the 90 size and is equipped with a safety retainer or bonnet to prevent the loss of themoil point. Some foremen prefer a 60-size hammer which delivers a

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CHLOREA GRANULAR is a new form of Chlorea weed and grass killer. The dry, dustless pellets require no mixing . . . they are ready and easy to apply with simple equipment. These advantages are combined with the powerful "kill all" effectiveness already demonstrated by Chlorea in powder and liquid forms (used on railroads for the past several years).

Here are the important facts about Chlorea Granular:

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- 3 Easy to use . . . may be applied with any mechanical type spreader used for granular materials; or may be broadcast by hand.
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5 Contains 3 proven chemicals . . . this combination kills deep rooted weeds and grasses, as well as shallow-rooted grasses, weeds and annual seedling growth.

6 Is non-poisonous and does not create a fire hazard when used as directed.

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Dept. 6B, Bound Brook, N. J.

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CITY _____ STATE _____

What's the answer? (cont'd)

lighter but more frequent blow. Normally secondhand hammers, which have been discarded by ironworking gangs or shop forces, are utilized. These usually are still very effective for this type of work, which is hard on the hammer because of the dust created.

If the pile to be cut off develops bearing at approximately the cutoff elevation, the pile is cored out from the top down to the desired elevation.

If the pile develops bearing a foot or more above cutoff, the reinforcing steel is exposed in a band 18 in wide and extending from 6 to 24 in above the cap floor. Then the reinforcing steel at the top of the band is cut with an acetylene torch and the concrete core at the bottom of the band is broken off, either with the rivet hammer or by use of a maul and a gad. The waste portion of the pile is then removed by a locomotive crane.

Skill is required to cut the concrete pile, which, in this instance, is nor-

mally a 24-in hexagonal pile. A skilled man can cut and core a pile in 90 min. In rare instances when for emergency reasons or other causes, the pile head fails to go below the deck of the existing bridge, it can be cut off without coring in from 15 to 20 min by two men working on opposite sides of the pile.

Tells how he does it

By A. W. CARLSON
Engineer of Bridges & Structures
Western Pacific
San Francisco, Calif.

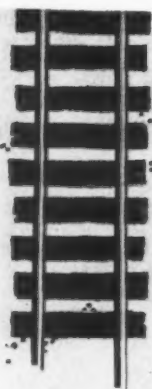
There are several ways of cutting off concrete piling, each way having its proponents who feel their individual methods are superior to any other. The method used by this company utilizes air-actuated equipment, and cutoffs have been made economically and quickly. Speed, of course, is of paramount importance on a main-line, single-track railroad. We have cut off precast reinforced-concrete piles 2 ft and less in diameter by the method given below.

At the point of cutoff, and for some 2 ft above this point, the longitudinal steel is exposed, using paving breakers. The vertical steel, including the spiral caging, is then cut off, using oxygen-acetylene cutting equipment, allowing a sufficient protrusion to provide an adequate tie to the succeeding structural member. When this has been accomplished, if the cutoff is long enough, a line from a crane can usually snap the pile off at the proper point. If this cannot be accomplished, the concrete is drilled at the cutoff line and broken with steel wedges. After the rough cutoff has been made, the pile is trimmed to the cutoff line with a paving breaker equipped with appropriate trimming point.

The equipment used in making the actual cutoffs is commonly found on any construction project and consists of an air compressor of approximately 210-cfm; two paving breakers, with moil points; a jack hammer, with bits; an oxy-acetylene cutting outfit; an ample supply of steel wedges; and other small tools.

Although I would hesitate to recommend the above procedure over all other methods without first trying

(Continued on page 77)



Telephone poles, cross ties, bridges and other wooden engineering structures treated with Reilly Creosote Oil are still in use after 50 years, because they have been guarded in service by Reilly Armed Creosote.

Guard Duty for 50 years!

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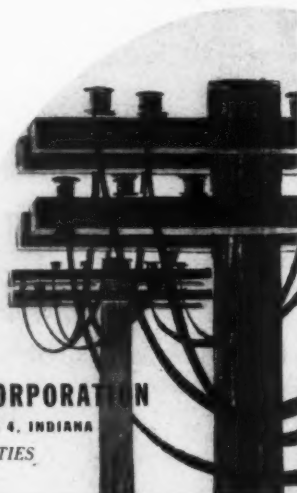
There is no guard duty so effective, and so economical. Specify Reilly Armed Creosote for wood preservation.



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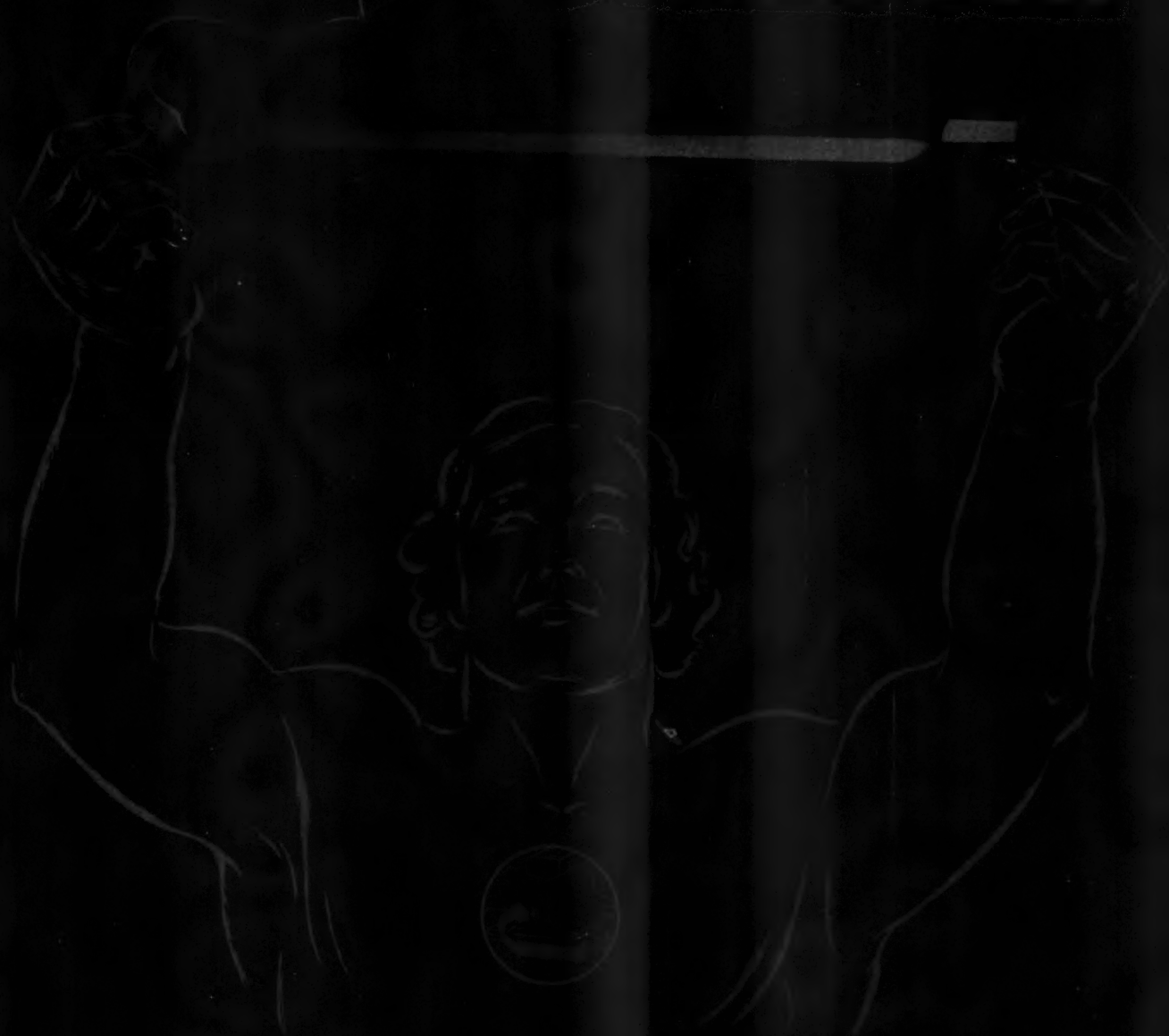
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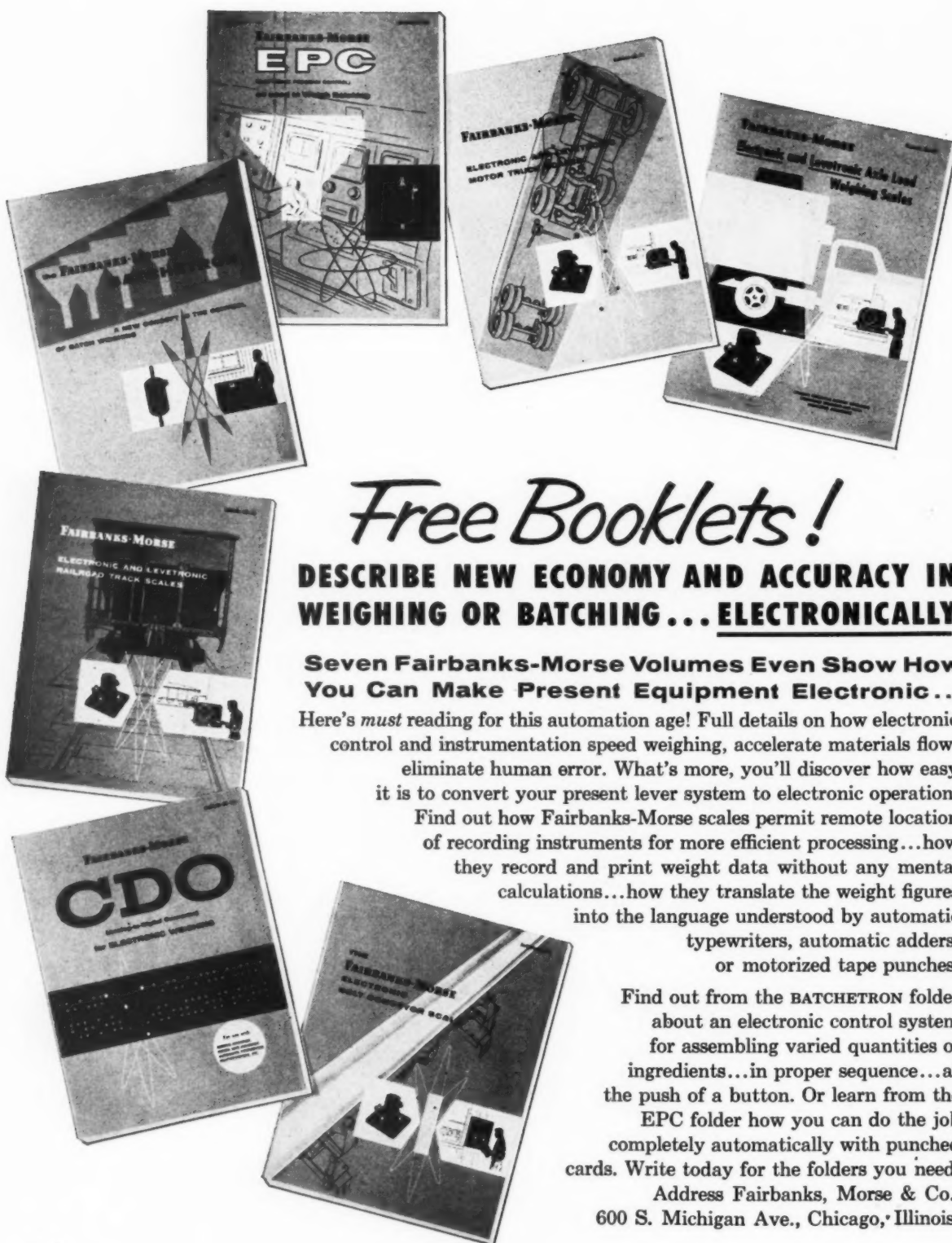
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What's the answer? (cont'd)

(Continued from page 74)

them, we have been quite satisfied with the results obtained. We have actually made finished cutoffs on a main-line single — track railroad in a few minutes.

Cleaning ditches in rock cuts

What machines, if any, can be used to advantage for cleaning out side ditches in narrow rock cuts? Describe how they can be used to best advantage.

On and off-track aids

By L. V. HEWETT
Roadmaster
Spokane, Portland & Seattle
Wishram, Wash.

On my district I have a Model No. 205 Koehring crane with clam-shell bucket mounted on a self-propelled Rail-Aid. With this machine we use a 6-yd shop-made dump box mounted on a push car. The crane loads the dump box, tows it to the point of disposal and tips it to discharge the material.

Whenever possible, I also use a Hystaway-equipped D-6 Caterpillar tractor having a 25-ft boom. Sometimes we bulldoze a road over the low side of a cut, then ditch from the top of the cut, using clam bucket attachments.

Uses on-track machines

By TORKEL TORKELSON
District roadmaster
Great Northern
Bonners Ferry, Ida.

From my experience, I have found that a self-propelled diesel-electric machine with combination ditcher and clamshell having a 1-yd or 1¼-yd bucket gives the best results under such conditions. I use two air-dump cars, one at each end of the machine, so both can be loaded, thereby saving movement time. The cars are hauled to points where the material

can be used for rip-rap or bank widening. This equipment requires pilot crew protection. On the other hand, work-train equipment can be used to advantage if rail traffic is heavy, due to slow-speed operation with the use of self-propelled machines.

In side-hill situations, where one side of the track is open for cast-over, I use off-track machines with clamshell buckets. In such areas, it is necessary to take precautions to assure that the machines are work-

ing in the clear. This type of equipment can be worked under flag protection, thus eliminating pilot crews.

Advocates "on-rail" equipment

By FRED WARNER
Roadmaster
Union Pacific
Pocatello, Ida.

The individuality of the cut is of first importance in deciding what equipment or machinery is best suited for cleaning the side ditches.

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187 Maplewood Ave., Maplewood, N. J.
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What's the answer? (cont'd)

The width and length of the cut, density of traffic and ease of disposing of the waste material must all be considered. This question apparently referred to a rock cut that is too narrow to allow off-track equipment to work inside the cut and still clear passing trains. Then, in my opinion, a small backhoe or dragline working from a "rail travel car," and used with "on-rail" trucks, would be ideal for this type job. This equip-

ment working under flag protection and a slow order could make use to the best advantage of track time with a minimum delay to traffic.

By planking the track at the ends of the cut, the trucks could have quick access to or from the track to pick up or to dispose of the waste material loaded into them by the backhoe or dragline. The backhoe or dragline working on the "rail travel car" can run to the ends of the cut, dismount from the travel car, pick up the car and set it in the clear for passing trains, and by the same

method return to the track when it is clear to continue working.

Lacking this equipment, or on lines where traffic is not too heavy, a Burro crane using a small clamshell or orangepeel bucket could be substituted for the rail travel car and dragline or backhoe, and a setoff built at one end of the cut for removing the Burro from the track to clear trains. Ordinary trucks running on planks nailed to the ties can be used in place of on-rail trucks.

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A Production Spraying Machine . . . 400 lineal feet per hour capacity used by leading eastern railroads for applying protective coatings on bridge decks and steel structures



The Patton B&B Sprayer (Patents pending) is equipped with adjustable booms for handling "spider" staging while applying grease type protective coatings on steel structures

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REMOTE CONTROL: middle man controls movement of machine while spraying



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When to use gage rods

Under what conditions is the use of gage rods justified? What factors govern their spacing? Explain.

On sharp curves

By S. P. BURDUSIS
Roadmaster
Southern Pacific
San Francisco, Calif.

The only justified reason I can give you for the use of gage rods is for keeping the gage from spreading on sharp curves.

We had some in use on yard tracks where the switching was done by consolidated steam engines. But they caused the rail to wear faster and, in due time, the gage rods would break when the ties got bad.

Now that diesels are in use, the practice of using gage rods has been discontinued on our road. I do not use them on my district. We may have some roadmasters who still believe in using them, but they are not carried as a standard item at our stores.

We were also using tie rods in street work where 141-lb rail, 9 in high is used. Holes were drilled every six feet near the center of the rail to keep it from working because of the height. But, due to economy, these also have been discontinued.

In my opinion gage rods or tie rods did not justify the cost of the material and labor in making them and then installing them.

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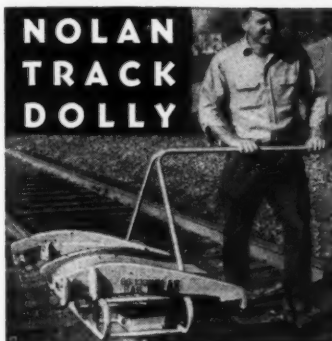
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You can get rails, ties, supplies, tools, rebar, etc., to the job with money-
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Built of tubular high-carbon steel. Extremely strong and serviceable. Oper-
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Length	Width	Ht. Above Rail	Weight	Length	Width	Ht. Above Rail	Weight
50½ in.	15½ in.	6½ in.	88 lbs.	36 in.	14 in.	6 in.	60 lbs.



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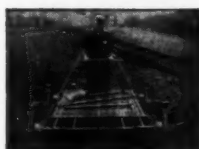
2000 lbs. capacity. All-tubular high-carbon
steel construction for safe carrying of ties,
rails, supplies, etc. Car breaks conveniently
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and transportation. Deck is heavy mesh ex-
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Platform size 48" x 45" Ht. above rail 8"
Weight 140 lbs. complete.

Write for complete railway supply catalog.

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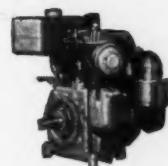
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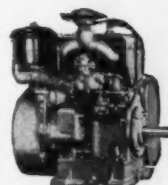
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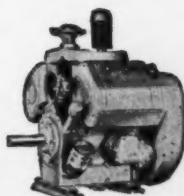
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What's the answer? (cont'd)

Foremen and public relations

Are the contacts between foremen and the public frequent and important enough to a railroad to justify the cost of conducting a personnel-training course for foremen? Explain.

An important subject

By E. H. HALLMANN
Director of Personnel
Illinois Central
Chicago

This question is not clear. When someone mentions a training course for foremen, this ordinarily indicates to us instructions which deal with the principles of supervision. But it would seem that the questioner is not interested in that type of a course, since he mentions contacts between foremen and the public. He apparently has in mind what we would term a public-relations course.

Many of our foremen have little or no direct contact with the public in connection with their work. In any event, we have never had, and do not now contemplate, having a course in public relations for our foremen. This does not mean that we are unmindful of the importance of maintaining good relations with the public.

This has long been an important subject on the Illinois Central. The importance we attach to it is indicated, in part, by the fact that several booklets on courtesy have been presented to all of our employees, as well as by the discussion of courtesy that appears in our family book, "This is Our Railroad." In addition, we recently gave a large number of our employees who have direct contact with the public a short but intensive course in telephone courtesy.

There is one thing about which I feel quite strongly. If we should ever decide to inaugurate a course in public relations, it will not be confined to foremen. We think people form their opinion of our service from the nature of their contacts with all of our first-line representatives. Included among these are conductors, flagmen, ticket sellers, information clerks, telephone operators, gate-men, dining car stewards, waiters, waitresses, agents, freight cashiers, receiving and delivery clerks, yard-

masters, switchmen, section foremen, and ushers in our passenger stations.

Training is important

By ARLEY A. WITHROW
Tracy, Minn.

The frequency of such contacts is relatively unimportant, since one public contact by a well-trained foreman will contribute much more than 10 or 100 contacts by an untrained employee.

It is important who is contacted by the foreman. But even more significant is the impression made upon the contactee. Training is needed to give the foreman knowledge, and the ability to present his knowledge and to create a good and lasting impression, so that the information will be passed on to other persons who may be more important to his company. This is the responsibility of the pol-

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Sales representative for well established manufacturer of railway maintenance equipment. Railroad experience or railway equipment selling experience necessary. Age 25 to 35 preferred. Exceptional opportunity. Communications definitely confidential. Write Box 828, RAILWAY TRACK & STRUCTURES, 79 West Monroe St., Chicago 3, Illinois.

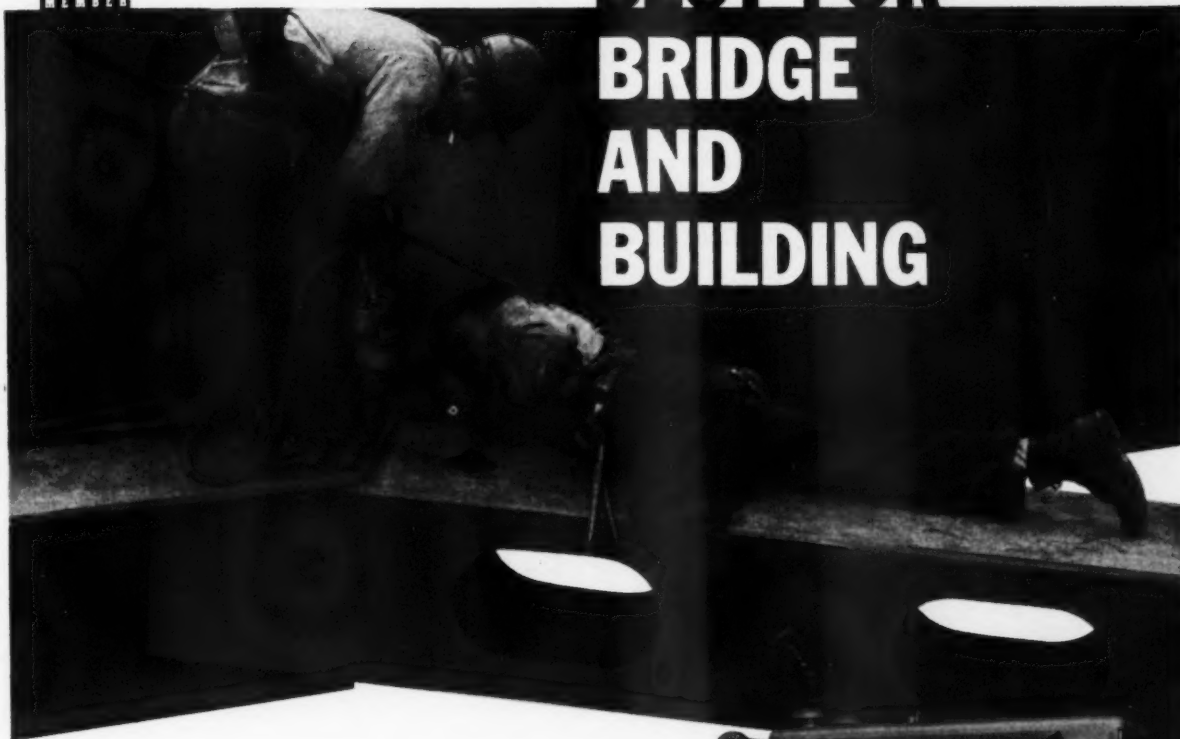
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CP-610 Standard Impact Wrench—This standard version of the "Torque Control" model handles bolt sizes up to 1½". Standard CP-610's with powerful rotary impact action are unexcelled for fast, safe nut running and the application or removal of bolts, studs or lag screws. Absence of twisting or kickback and little vibration minimize operator fatigue. Here's one used with an eight-inch extension shank—it's ideal for screw spike driving.



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RAILWAY TRACK and STRUCTURES

SEPTEMBER, 1958

81

What's the answer? (cont'd)

icy-making officers of the railroad. The important thing is to find a method and procedure for communicating authentic information to the foreman.

What information is necessary to guarantee a profitable public contact? First of all, the information must not be limited to that which pertains only to the foreman's own department. It should relate to specific questions which he may be

asked, or a subject in which he is interested enough to pass along to his contacts. It is important to realize that answers to questions which are apparent to officers of the railroad may be quite unanswerable by foremen because of poor or insufficient communication within his own company.

Perhaps the necessary training can be accomplished through a more positive approach of superior to subordinate in the passing of information from president to foreman. In short, tell much of the truth as often

as possible in the chain-of-command. Investigate with doubt the premise that the size of a railroad makes this communication difficult, if possible at all. Today, in communicating information to its employees, a railroad is no larger than its smallest subdivision.

Perhaps separately, or in conjunction with the chain-of-command approach, a great deal of the right kind of information may be communicated to foremen through their union, and at the same time make a "phantom" salesman of the union itself.

If neither of these methods produce satisfactory results, it may then be necessary to conduct a formal personnel-training course for foremen. This is the least desirable because of its relatively high cost, which often is prohibitive in view of existing financial conditions.

Any one or combination of these methods of training will have an initial cost, but the profit realized will certainly justify the expenditure of time and money. And no matter how often or with whom the public contact is made, the trained foreman will continue to justify the expense as long as he remains with his company.

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To the editor

Says porcupines are gnawing his bridges

TO THE EDITOR:

We have five lattice-covered wooden bridges, built in the late Nineties, on our railroad. Within the last few months porcupines have attacked these bridges by severely gnawing the wooden members. This is causing us considerable concern.

We have tried daubing the members with creosote and paint but this does not seem to discourage the rodents. Also, we have checked locally with the State Forestry and Highway departments for a solution with no satisfactory result.

Have you any helpful information on this problem?

C. J. MORRELL
Vice President & General Manager
St. Johnsbury & LeMoyne County
Morrisville, Vt.

(This problem has us stumped. We've contacted all the experts we can think of, but they don't have the answer either. Perhaps some of our readers have encountered the same problem and have discovered ways of dealing with it. If so, they would earn Mr. Morrell's gratitude by making their findings available to him. —Editor)

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ERIE RAILROAD SAVES TWO WAYS WITH ALCOA ALUMINUM SIDING

The Erie Railroad recently installed 100,000 square feet of Alcoa® Aluminum Siding in their new Meadville, Pennsylvania, car repair shop after comparing costs with protected metal and stainless steel. They found that aluminum would *never* need protective painting—yet initial cost was lower!

They also discovered that good-looking, embossed aluminum siding offers other money-saving advantages: resistance to corrosion, smoke, fumes and grime; freedom from rotting and warpage.

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the bill. Its glass fiber wall will keep those rooms drier—easier and cheaper to heat and cool. And corrosion-resistant aluminum gutters, downspouts, sash, copings and gravel stops will save Erie many more dollars in upkeep.

Alcoa Aluminum is playing an ever-greater part in *profitable* railroading. To help you reduce costs, Alcoa has prepared two new booklets. *Alcoa Aluminum Building Products* contains technical information on aluminum roofing and siding sheet and is particularly valuable for engineers. *Sandwich Walls of Alcoa Aluminum* describes the application and advantages of this economical wall system. For your

FREE copy, write Aluminum Company of America, 2164-J Alcoa Building, Pittsburgh 19, Pa. And for immediate help with any problem in aluminum, call your nearest Alcoa sales office.



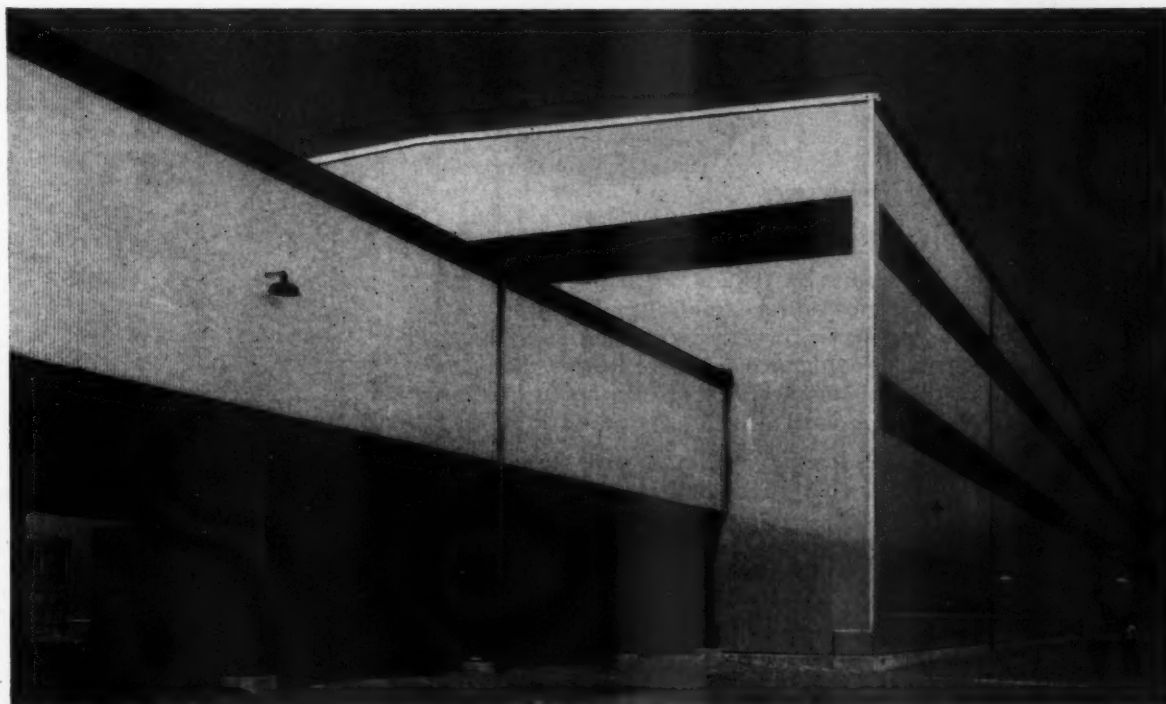
Your Guide to the Best
in Aluminum Value



"ALCOA THEATRE"
FINE ENTERTAINMENT
ALTERNATE MONDAY EVENINGS



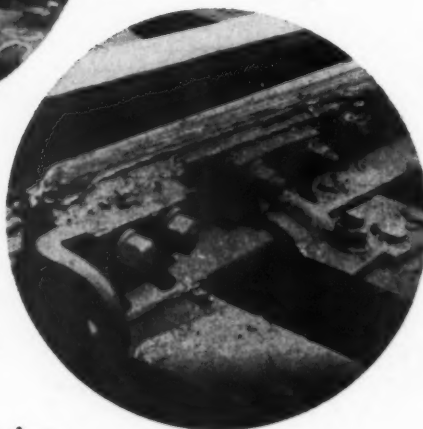
Building: Erie Railroad, Car Repair Shop,
Meadville, Pennsylvania
Consultant: Osborn Engineering Company,
Cleveland, Ohio
General Contractor: Hughes-Foulkrod Company,
Philadelphia, Pennsylvania
Aluminum Subcontractor: Elwin G. Smith &
Company, Inc., Pittsburgh, Pennsylvania



Why "FROG, SWITCH" heat treated switch points last up to 15 times longer than untreated points!



Ordinary switch point (open hearth steel) without benefit of heat treatment. Ragged tip indicates low wear resistance. Result: Short life under heavy service.



"FROG, SWITCH" heat treated switch point after 5 years heavy service! Note absence of wear at extreme point. Result: Up to 15 times longer life under heavy service.

Here's a real saving in switch maintenance costs!

Heat treated switch points by "FROG, SWITCH" are investments with a high rate of return. Controlled heat treatment of fully machined points imparts the ideal degree of hardness and toughness throughout their entire length. Reduced maintenance and maximum service life add up to greatest yield per switch point dollar!

Let us show you how leading railroads are setting new records for long switch point life.

The FROG, SWITCH & MANUFACTURING CO.

CARLISLE,

PENNSYLVANIA

Products (cont'd)

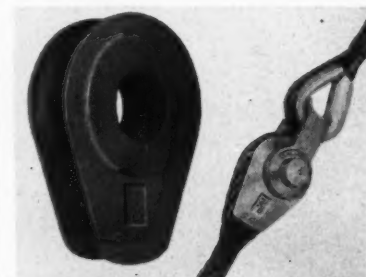
(Continued from page 60)



Non-slip surface on . . .

New floor covering

A NEW resilient floor covering called "Scotch-Tred" is now available for use in halls and corridors, locker rooms, waiting rooms and reception areas, and on walks, stairs and ladders. It is claimed to be resilient with a non-slip surface and to combine the beauty and comfort of carpeting with the practicability and toughness of tile. The covering is applied by stripping the protective backliner from the pressure-sensitive adhesive and pressing to a clean, dry surface. Its weight is 2½ oz per sq ft. It has a maximum thickness of 50 mils and is claimed to be non-sparking, non-abrasive, and resistant to oils, chemicals, solvents and many acids. It is sold in several colors in rolls, strips or tiles. The product can also be used to cover walls subjected to marring or severe damage due to impact. *Minnesota Mining & Manufacturing Co. Dept. RTS, 900 Bush St., St. Paul 6, Minn.*



Minimize bending with . . .

Wire rope thimble

A NEW solid, wire rope thimble, having a large radius to minimize rope bending, is now offered for use with open sockets, wedge sockets and the manufacturer's boom-pendant clevis. A steel casting, the new thimble is available for all sizes of wire rope, from ½ to 1 ¾ in. and for use with pins from 1 to 2½ in. in diameter. The manufacturer reports that a special

**For System-wide Protection
at these vital points!**



Install—
NATIONAL
RAILWAY
SPRING LOCK WASHERS



NATIONAL Railway Spring Washers are designed to keep bolts tighter by maintaining constant bolt tension, absorbing shocks and protecting rail ends. They withstand the extreme stresses and strains of continuous, heavy traffic... reduce maintenance costs system-wide!

Serving Industry Since 1886

**THE NATIONAL LOCK WASHER
COMPANY — NEWARK 5, NEW JERSEY, U. S. A.**



A Complete Line of Railway Spring Washers

Products (cont'd)

casting process assures uniform, smooth-sided pin holes and an unusually smooth score in every thimble. Crosby-Laughlin Division, American Hoist & Derrick Company, Dept. RTS, P.O. Box 570 L J, Fort Wayne, Ind.

Roofs repaired in rain . . .

With asphalt mastic

LONG-LASTING repairs to built-up asphalt roofs are said to be possible in the most adverse weather conditions by using Addex Hydro-Shield. This is a two-component product, consisting of improved, ready-to-use asphalt mastic combined on the job site with glass fiber mesh reinforcement to give it high strength. Designed specifically for application in damp or wet weather, the mastic-mesh combination permits repairs to be made under water, if necessary.

The Addex asphalt mastic is said to have the ability to displace water and to adhere firmly to the damaged surface. The strong, flexible membrane is made of cable strands of glass, bonded with additive-treated asphalt to give compatibility with the mastic. In addition to its water-displacing qualities, it is claimed that the mastic maintains good handling consist-



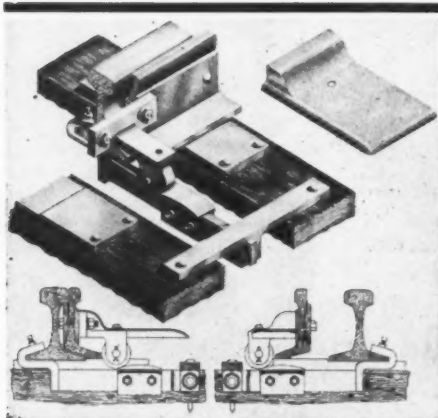
MASTIC is trowelled to displace water.



MAT is laid and covered with mastic.

ency over a wide temperature range, for both summer or winter application. The 27-in-wide rolls of glass reinforcing membrane are light in weight and easy to handle, according to the manufacturer, and can be easily cut and trimmed to size with ordinary tools.

Created specifically to overcome the heretofore unsolved problem of making reinforced repairs in rain or snow, Hydro-Shield is also said to be suitable for reinforced waterproofing of subgrade foundations and walls where hydrostatic pressure is anticipated. The resilient mastic-mesh combination is said to minimize the effects of building movement, since it absorbs stress by yielding and stretching instead of cracking. Labco, Inc., Dept. RTS, 10699 Broadway, Cleveland 25, Ohio.



Here's How You Cut Switch Maintenance Costs!

Gray-Wade Railway Switch Point Roller

- ▶ LESS MECHANICAL EFFORT REQUIRED TO THROW SWITCH.
- ▶ LESS TIME AND LUBRICANT NEEDED IN MAINTENANCE.
- ▶ INSTALLED WITHOUT INTERFERENCE OF TRAIN MOVEMENTS.

Write for details to

DRILL CARRIER Corporation
SALEM VIRGINIA

Drift limited with . . .

New herbicide

SPRAY DRIFT is cut to a minimum, it is claimed, by a new material which promises effective weed and brush control. Designated Inverton 245, the new material is a 2,4,5-T product formulated in an invert emulsion. The invert emulsion is a dispersion of oil particles in water—the reverse, it is pointed out, of a standard emulsion.

It is this, the manufacturer states, which gives the mixture a thick creamy consistency that is said to be responsible for most of the unusual properties claimed for the product.

Inverton 245 is sprayed on vegetation in large particles and does not break into a mist, thereby, it is said, reducing the possibility of damage to nearby crops. In addition, it is said, the product is a non-volatile free-acid formulation, cutting the possibility of herbicide vapors causing damage to adjacent land.

The thick consistency of Inverton 245 is said to cause it to cling tightly to branches and foliage. This permits spray crews to work in wet weather, it is claimed. During 1957 trials, the manufacturer reports good brush control from spray applications made just before, after and even during rain showers. Good top kills have resulted from applications made during virtually all seasons of the year, it is said. Dow Chemical Company, Dept. RTS, Midland, Mich.

MODEL 441

PETTIBONE



SPEED SWING

THE MACHINE OF MANY USES

**180° SWING LOADER • 4 Wheel Drive • 4 Wheel Steer
BUCKET • TOTE CRANE • FORKS
Off-Track Machine... One-Man Operated**



LAYS RAIL • LIFTS TOOLS ON AND OFF TRACK



ROOTS AND LOADS TIES



BUILDS SHOULDERS • STOCK PILES



REMOVES SNOW FROM STATIONS, YARDS, TRACKS

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Onan ELECTRIC PLANT NEWS



3,000 watts

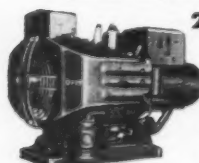
New Onan all-purpose Diesel Electric Plant cuts costs in half!

Lower fuel cost, less maintenance, longer life, cut power generation costs with the Onan 3DSL to half that of small gasoline-powered electric plants! For applications requiring an almost continuous supply of electric power, this new unit gives you unmatched economy and season after season of service.

Lighter weight and compact

The new 3DSL is powered by an Onan single-cylinder, air-cooled full-Diesel engine. Available in all standard A.C. voltages and as a 32-volt battery charger. Vacu-Flo cooling, permitting enclosed installations, is standard. The 3DSL has a new mounted muffler, more efficient dry-type air filter, new geared crank, and it's hooded for protection on the job. Smoother running, lighter weight, and compact.

New lower price makes it an even bigger value . . . allows you to "go Diesel" for more power generation needs.



2-cylinder, 5KW ONAN DIESEL

SERIES 50RP. Air-cooled horizontally-opposed, smooth-running full Diesel engine. All standard voltages available. A higher capacity unit for continuous, low-cost operation.

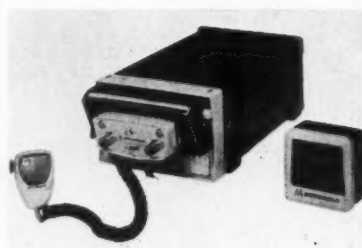
Onan A.C. gasoline-powered plants: Air-cooled—500 to 10,000 watts. Water-cooled—10 to 150 KW.

See your Onan distributor or write for information

D. W. ONAN & SONS INC.

3712A University Avenue S. E.
Minneapolis 14, Minnesota

Products (cont'd)

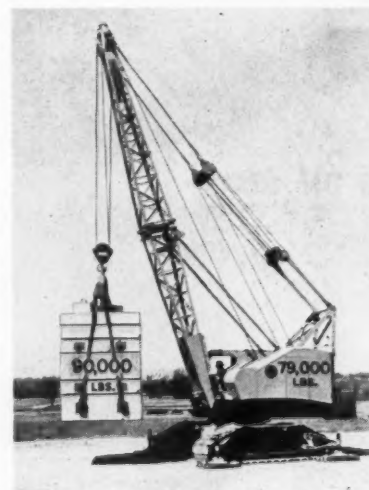


Greater reliability with . . .

Two-way radiophone

A TRANSISTORIZED power supply and an advanced unified-chassis design are said to be features of a new mobile two-way radiophone operating in the 450-470 mc frequency band. This new unit, the manufacturer states, makes "T-Power" radio available in all frequency bands and all conventional ratings.

The new unit weighs but 34 lb, compared with 74 lb in former 450-470 mc mobile radiophones. It is produced in a 10-in housing for both under-dash and trunk mountings. It provides 18 watts transistor power output and a new high of 3 watts receiver output. It operates from a 12-volt electrical system, positive or negative ground. *Motorola Communications & Electronics, Inc., Dept. RTS, 4501 W. Augusta Blvd., Chicago 51, Ill.*



Pivoting outriggers on . . .

Crawler crane

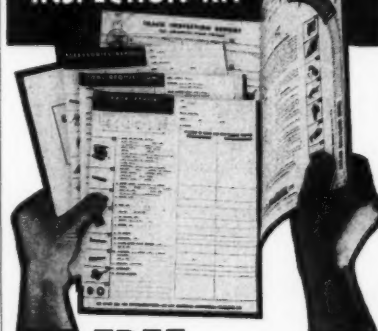
CAPACITY TO LIFT 90,000 lb with a 40-ft boom is said to be an important feature of a new crawler crane, designated the 545 "Sprawler." The reason it is said to be important is that this weight is 11,000 lb more than the working weight of the machine. The high lifting capacity is made possible by the provision of four pivoting outriggers for use when making heavy

lifts. The outriggers can be quickly swung into position and pedestals attached. For moving, the outriggers can be folded back to an out-of-the-way position alongside the crawlers, or they can be removed entirely. Without use of the outriggers, the 545 can "walk" with 61,500 lb.

For transporting, the "Sprawler" can be stripped to reduce its shipping weight from 79,000 lb to 47,500 lb. The counterweight is power removed with an A-frame. Also, with the A-frame lowered, the 545 can be moved through low-clearance structures. The highest point with the boom lowered is 16 ft 0 1/4 in. This can be reduced to 11 ft 6 in when the boom and A-frame are removed. Overall length of standard crawlers is 14 ft 3 in. Equipped with 30-in shoes, the overall width is 11 ft 2 in, and with 36-in shoes, 11 ft 8 in. This machine is also available as a truck crane. *Koehring Division, Dept. RTS, Milwaukee 16, Wis.*

Correction—Several typographical errors occurred in the article in the June issue entitled "The case for all-welded bridges." In the left-hand column, page 29, second paragraph, ninth line, the word "it" should be "is." In the middle column, page 30, second paragraph, seventh line, the figure "5 3/8" should be "5 1/2." In the right-hand column, page 30, fourth paragraph, sixth line, "Smith" should be "South" (J. E. South, system engineer structures, Pennsylvania).

SEND FOR FOSTER'S TRACK INSPECTION KIT



FREE easy-to-use guide simplifies and improves your industrial customers' track maintenance.

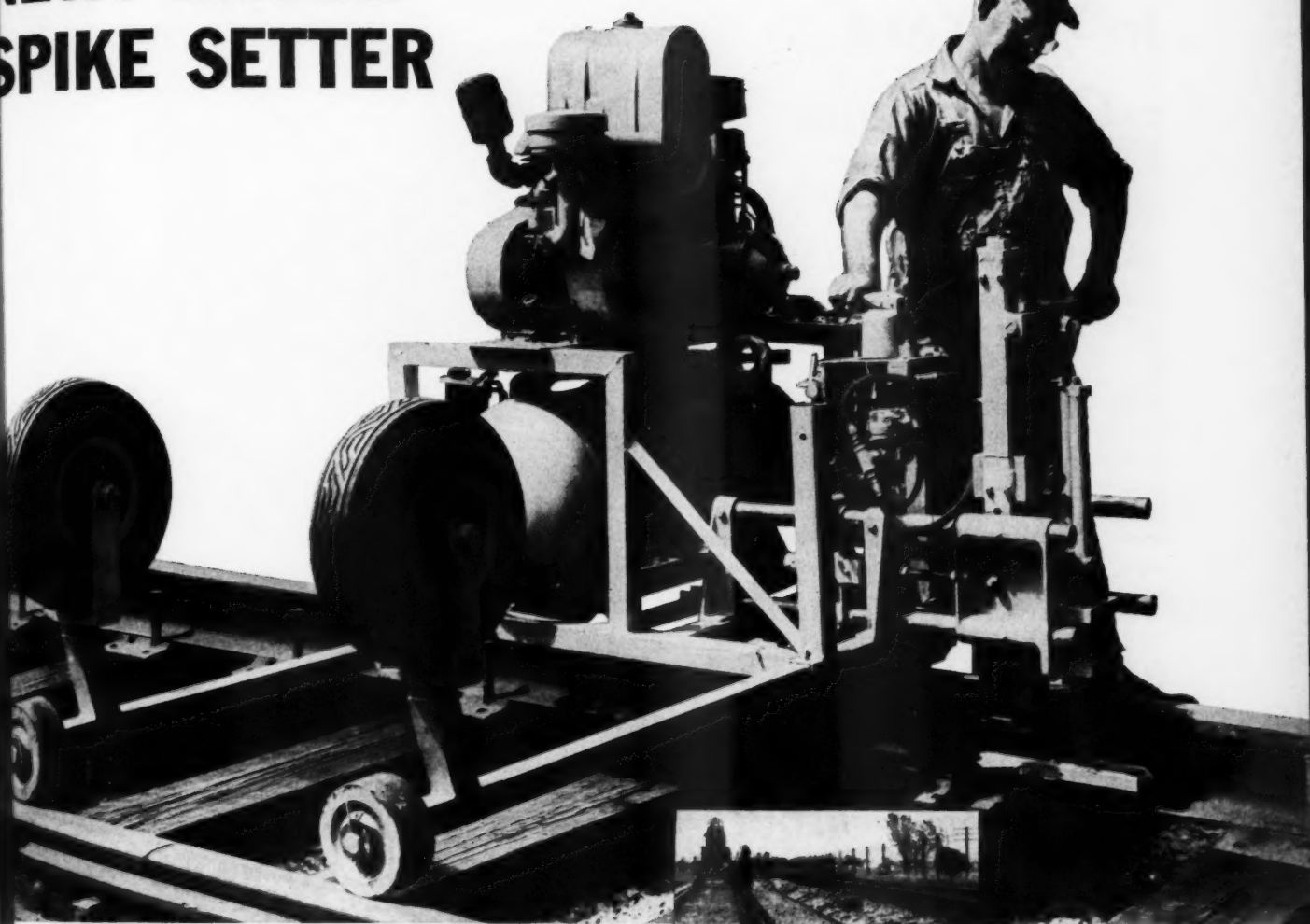


WRITE FOR
INSPECTION KIT # RA-7

L.B. FOSTER co.

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NEW! RACOR[®] SPIKE SETTER



Pays for itself in less than five months!

Because it saves from three to seven men in the average rail gang, the new Racor Spike Setter can pay for itself in 2½ to 5 months of operation. In addition, this efficient Spike Setter speeds up the actual spike driving operation, reduces clean-up operations to a minimum, and produces better track through uniformly set spikes which go down straight.

Produced after a long series of field tests in cooperation with leading railroads, the Racor Spike Setter is a self-contained, pneumatically operated piece of track maintenance equipment. Power is supplied by a gasoline engine driven air compressor, furnished as an integral part of the machine. It is manufactured to the same high standards of materials and workmanship as the Racor Dual Driver, which has established a record of low down-time and low maintenance cost.

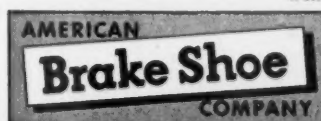
Instead of the four to eight men usually required to set spikes, only one or two men are needed to position spikes ahead of the Racor Spike Setter. If your road could use savings like this, it will pay you to get full details promptly from your American Brake Shoe representative.



Here's how spikes should be set! The Racor Spike Setter leaves them straight, true, even—just right for fast, efficient driving.

How It Works

The Racor Spike Setter can be used with any spike driving equipment — pneumatic hammers, mechanical drivers, or Racor Dual Drivers. Spikes are placed by hand in the tie plate holes, leaning against the rail. The Racor Spike Setter then aligns each pair vertically and sets them with a single powerful blow from an air hammer. The operator easily moves the machine along the track with one hand and triggers the mechanism with the other.



RAILROAD PRODUCTS DIVISION
530 Fifth Avenue • New York 36, N. Y.

In The Yard... OR On The Line **BURRO**

WORK POWER PAYS!

When a BURRO goes to work — in the yard or on the line — it delivers fast, low cost performance. Equipped with bucket, magnet, hook, tongs or dragline bucket, a BURRO is ready and able to do the hundreds of odd jobs railroad work calls for. Fast travel speeds (up to 22 mph.) and heavy draw bar pull enable the BURRO to move itself and a work train or cars to the job in a hurry. Once on the job, a BURRO wastes no time getting the work done. BURRO's work power pays dividends every day it operates.

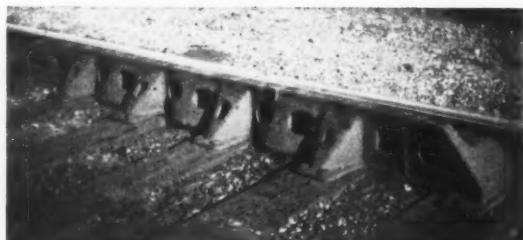
Write for illustrated BURRO Catalogs

CULLEN-FRIESTEDT CO.

1301 S. Kilbourn Ave., Chicago 23, Ill.



REDUCE LABOR COSTS BY USING Q AND C ONE-PIECE GUARD RAILS



The simplicity of design of Q and C Guard Rails made in one piece results in economy of labor of installation and maintenance as compared to Guard Rails with separate braces, plates, fillers, bolts and foot guards.

They are made of full manganese steel with wear resistance that assures long life under heavy traffic conditions.

Specify Q and C Guard Rails on your requisitions.

Other Q and C Products:

Car Stops
Derails
Switch Point Guards
Step Joints
Guard Rail Clamps
Gauge Rods
Car Replacers

Snow Flangers and Plows
Skid Shoes
Anti-Slip Rail Tongs
Flangeway Brackets
Electric Snow Melters
Gauging Tools
Foot and Heel Guards

Serving Railroads Since 1886.



90 West Street
NEW YORK 6

THE Q AND C CO.

59 East Van Buren Street
CHICAGO 5



611 Olive Street
ST. LOUIS 1

Supply Trade News

AEROQUIP CORPORATION — A new plant with 10,000 sq ft of floor space has been constructed by this company at Dallas, Tex. The new plant will provide complete facilities for assembly, proof testing and inspection of hose assemblies.

BIRD & SON — Robert W. Carpenter has been appointed representative in the Cleveland area for tie pads and other railroad products manufactured by this company.

A. M. BYERS COMPANY — Robert J. Heister has been appointed manager of the Pittsburgh division. Mr. Heister has been with the A. M. Byers Company since 1948. He started in the engineering service department, and later worked as a field service engineer out of the Pittsburgh Division office.

FAIRMONT RAILWAY MOTORS — W. H. Ripken, district manager at New York, has been appointed export manager with headquarters at Fairmont, Minn. to assist W. D. Brooks, vice-president - export. W. W. Welchlin has been appointed assistant export manager, and Fred A. Kaup has been appointed district manager at New York to succeed Mr. Ripken.

KOEHRING COMPANY — Phillip E. Cunningham has been named new product manager for the line of excavating machines manufactured by this company's Koehring Division. He will have headquarters at Milwaukee, Wis. Edward R. Gee, Philadelphia, Pa., has been appointed district representative for the Northeastern United States.

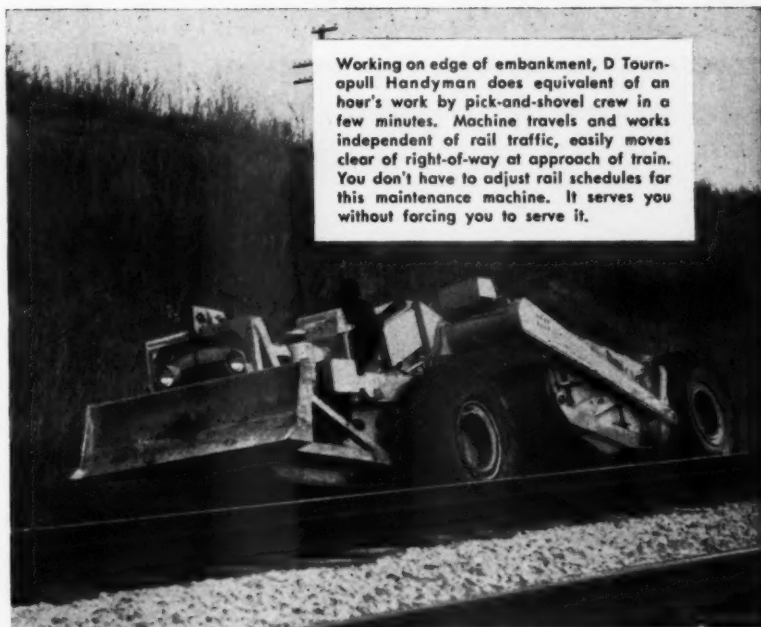
KOPPERS COMPANY — Walter P. Arnold, vice-president and general manager of this company's Wood Preserving Division, has been elected executive vice-president of the company. Douglas Grymes, Jr. succeeds Mr. Arnold as vice-president and general manager of the Wood Preserving Division.

PENETRYN SYSTEM — C. H. Anderson has been appointed representative at Cleveland, Ohio. He will represent the company on various mid-western and eastern railroads.

TEXAS COMPANY — J. C. Droke has been appointed manager of railway sales. Formerly assistant sales manager, Mr. Droke succeeds J. B. Flynn, who has retired after 40 years of service with this company. D. C. Akers, assistant manager of railway sales of the Chicago division, has been promoted to assistant sales manager to succeed Mr. Droke.

Obituary

Robert A. Bussan, executive vice-president of the Matisa Equipment Corporation, Chicago Heights, Ill., died suddenly on August 2.



Working on edge of embankment, D Tournapull Handyman does equivalent of an hour's work by pick-and-shovel crew in a few minutes. Machine travels and works independent of rail traffic, easily moves clear of right-of-way at approach of train. You don't have to adjust rail schedules for this maintenance machine. It serves you without forcing you to serve it.

Save time and expense on right-of-way maintenance

handle scattered clean-up with 1-man D 'Pull*

NOW much of the load-haul-and-spread operations on your right-of-way maintenance can be a one-man, one-machine operation—with the LeTourneau-Westinghouse D Tournapull® Handyman. This self-propelled, rubber-tired scraper isn't tied to rails. 138 hp, 9-yd "D" can be push-loaded, or will self-load up to about 75% of capacity. It travels shortest route to work — via right-of-way, highway, or cross-country — at speeds to 29.5 mph.

Once the 'Pull operator has his orders, he's on his own — doesn't have to wait around for a crew, work train, or dispatcher orders. Nor does he have to wait for main line clearance. He goes directly to his work, at roading speeds to 29.5 mph... gets into action as soon as he arrives!

Tires float over obstacles

Low-pressure tires of D 'Pull provide a smooth-rolling surface for travel. Yet, tire lugs bite in deep when pulling power is needed. These 5'-high, 1½'-wide pneumatics flex over rails, ties, and other obstacles with a cushioning action... roll across tracks or over switches without causing or taking damage.

For close work in confined quarters — a common situation on right-of-way embankments — "D" has high maneuverability. This L-W Handyman turns 180° in 24'8" ... eases through narrow 8' cuts... travels via highway in all 48 states without permit. Electric controls are quick and positive.

Interchange hauled work units

A dozer blade is available for the D 'Pull. The hauled scraper can also be interchanged with a Rear-Dump body behind the same prime-mover, for hauling shovel-loaded material. Or with a lift-and-carry crane, with an arch suitable for hauling rails, poles — equipped with 61,500-lb-pull electric winch. Also available are interchangeable flatbed and side-dump haulers.

Compare with present methods

Get all the facts on the versatile, mobile 138 hp D Tournapull now. Compare its work and travel performance... its manpower requirements... with whatever combination of men and machinery you may be using at present. Write for complete specifications on the versatile "D".

*Trademark DP-1832-RR-2/3



LETOURNEAU-WESTINGHOUSE COMPANY

Railroad Sales Division
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company
Where quality is a habit



QUICK STARTS FOR COLD ENGINES* ALL YEAR . . .



DOWN TO 65° BELOW ZERO

Starting a cold engine without SPRAY STARTING FLUID is costly. Constant wear of the starting system . . . wasted man hours . . . equipment down-time . . . repeated engine strain, can be prevented with a pressurized can of SPRAY STARTING FLUID. It's so easy to use! Apply SPRAY STARTING FLUID into the air cleaner or intake air stream while cranking the engine. Continue spraying until the engine runs smoothly. Use SPRAY STARTING FLUID regularly for quick, easy and economical starting of diesel and gasoline engines. Start every work day with SPRAY!

*Until the engine reaches normal operating temperature it is a cold engine.

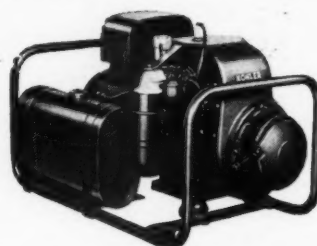
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KOHLER ELECTRIC PLANTS

On-the-job power
anywhere, any time

For maintenance of way, portable Kohler plants provide compact, reliable power—also for wrecking trains, erection of signal towers, trestles. Other models for end-to-end communications, caboose lighting and refrigeration, work trains, tunnels, electro magnets. Backed by an 85-year-old quality reputation. Sizes from 500 watts to 100 KW, gasoline . . . 10 KW to 100 KW, diesel . . . Battery-charging plants in 6, 12, 32 and 110 volt models. Write for folder C-19.



Model 2.5MV55
2500 watts, 180
cycle, 230 volt, 3
phase AC; with
combination 115 volt
DC. Manual start.

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ATLANTIC COAST LINE CALLS ON A D9



TO BUILD SPEED INTO ITS MAINLINE

When Atlantic Coast Line Railroad wanted to build speed into its mainline track near Halifax, N. C., it assigned one of its Caterpillar D9 Tractors to the job. This is becoming standard procedure among railroads. When a big, important off-track job requires action and high production, the biggest single-engine tractor of them all gets the call.

The D9 can do jobs quicker and more efficiently than any other tractor in the world. Its powerful turbocharged engine delivers 320 horsepower at the flywheel. And the 'dozer capacity is a whopping 20 tons.

But most important, this production is built into a machine that is designed to stay on the job day in and day out. This machine wins preference because of such features as: choice of torque converter or the exclusive oil clutch, the constant mesh trans-

mission, air-cooled brakes, precision-welded steel steering clutch case and frame unit, effective bellows-type final drive seals, and its tinker-free efficient fuel system.

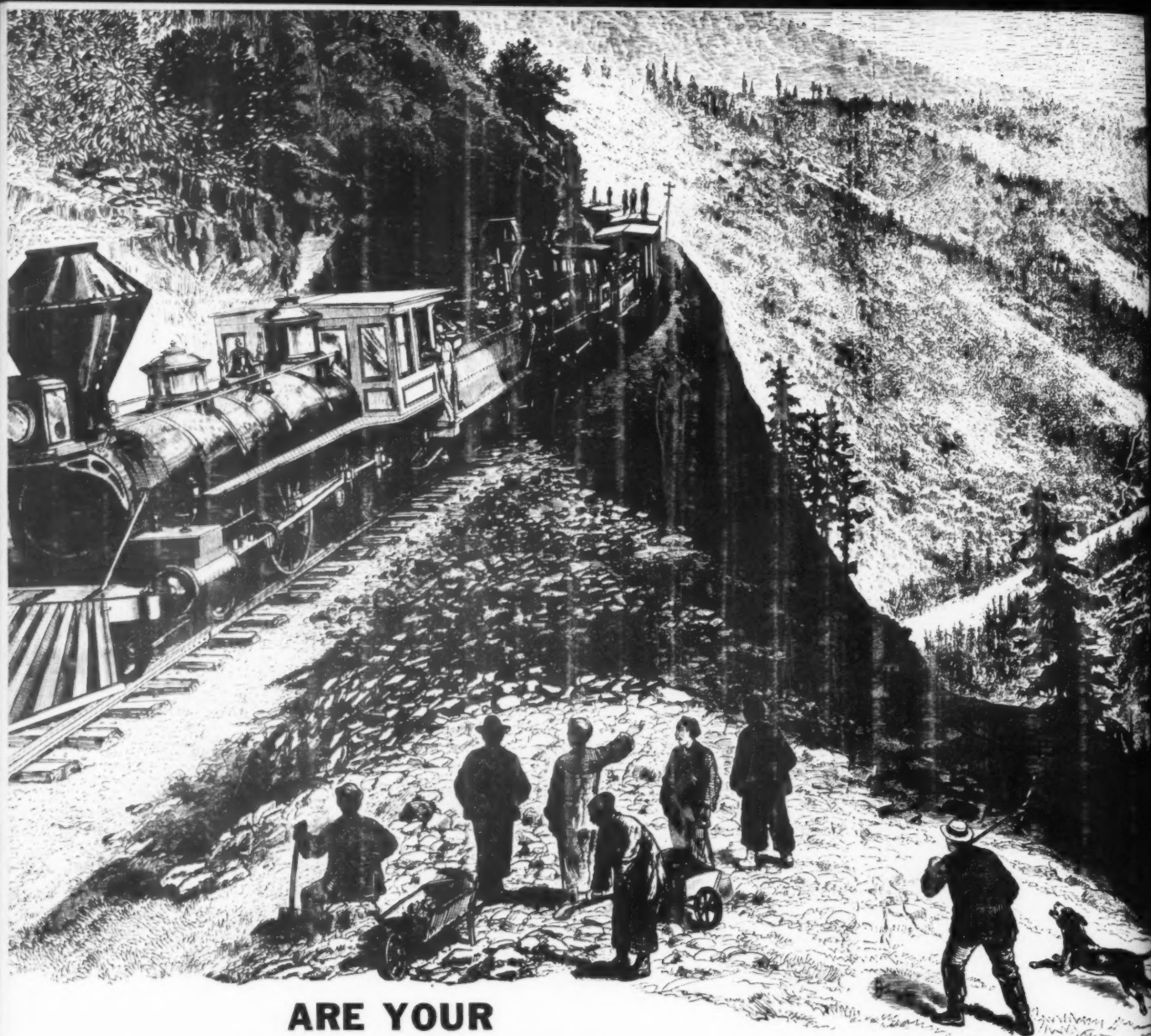
Finally behind the D9 and all Caterpillar machines stand the nationwide services of the Caterpillar Dealer organization and Parts Depot. Wherever you work, quick service and quality parts are near at hand. You do not have to tie up capital in a big inventory of parts, because your dealer stocks them for you. Call him today for a demonstration on your job. Just tell him you want the equipment there.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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**THE NO. 1
RAILROAD CONSTRUCTION
EQUIPMENT**



ARE YOUR LUBRICATION METHODS AS OUT OF DATE AS THE DIAMOND-STACK?

When locomotives like this were the fastest things on wheels, lubrication methods were simple enough to get along without an extensive organized lubrication program.

Today, organized lubrication is one of the surest ways to get top efficiency and economy from your maintenance-of-way equipment. And as maintenance equipment becomes more complex, it's essential that it receive the right kind of lubricants as well as the right amount.

You can get proper lubrication for all your equipment, at less cost, if you call a Texaco Lubrication Engineer. He knows exactly the right lubricant for each machine, and he can help you cut your lubricant inventory by suggesting some of Texaco's multi-purpose lubricants.

You can get the advantages of Texaco service anywhere in the 48 States—in fact, Texaco is the *only* source

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